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The European GreenBuilding Projects Catalogue September 2012 – December 2013

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2014

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The European GreenBuilding Projects Catalogue September 2012 – December 2013

Paolo Bertoldi
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Presentation

The goal of substantially improving end-use energy efficiency and promoting the use of renewable energy sources is a key component of the EU energy and environmental policies, shared by all EU Member States. The European Commission Directorate General Energy and Transport contributes to this goal through a series of actions under the "Intelligent Energy - Europe" Programme. In addition, given the large share of energy consumption in buildings and the large cost effective energy saving potential, special attention has been dedicated to the building sector. To this end a major step forward is represented by the Directive 2010/31/EU on the Energy Performance of Buildings.

The GreenBuilding Programme (launched in January 2005) is one of these actions, aimed specifically at private and public non-residential buildings.

The GreenBuilding Programme is a European Commission voluntary programme through which non-residential building owners and occupiers, being private or public organisations, are aided in improving the energy efficiency and to introduce renewable energy sources into their building stock. Any enterprise, company or organisation (hereinafter defined as "organisation") planning to contribute to the GreenBuilding Programme objectives can participate.

This document describes some of the projects implemented by GreenBuilding Partners in the period September 2012 to December 2013. The projects have been implemented in different types of buildings, such as office buildings, schools, hotels, shopping mall, etc. Both new construction and the refurbishment of existing buildings are covered by the report.

Additional information on the goals and the results of the GreenBuilding programme, as well as the current Partner's list and the list of the National Contact Points can be founded in the GreenBuilding Programme website at:

http://iet.jrc.ec.europa.eu/energyefficiency/

Paolo Bertoldi

Index of Projects

Partner: Aachen Münchener Lebensversicherung AG

Building: Theresienhöhe Nord

GreenBuilding : 2012

Project: New building

Address: Theresienhöhe 28, 80636 - München

Country : Germany

Building Description and Technical Measures

This project concerns a new office building with a heated floor area of 10.233 m^2.The building is supplied by district heating. On the heating system a night-drawdown and weekend-drawdown system is active. The building is equipped with a centralized mechanical cooling plant and with room air conditioner. To avoid unwanted solar gains windows are fitted with selective glazing and shading devices. Local free cooling is part of the cooling strategy. The ventilation system is provided with a heat recovery system. All energy consumption are recorded. The lighting system is equipped with efficient lamps, electronics ballasts and painted reflectors.

Technical Data

Building use	**Office**
Area	**10.233 m²**
PEC before or reference value	**207,77 kWh/m²y**
PEC	**150,20 kWh/m²y**
Energy savings %	**27,71 %**
Absolute savings	**589.114,00 kWh/y**
Financial info	/

Partner: Aberdeen Asset Management

Building: Koy Falcon Hali

GreenBuilding : 2012

Project: New Building

Address: Vaisalantie 4, 2130 - Espoo

Country : Finland

Building Description and Technical Measures

This office building includes a cafeteria and a parking in the basement. It is supplied by district heating and equipped with radiators. The cooling plant is equipped with an air-water heat pump. Cooling strategy is also supported with selective glazing on the southern and western facade. The ventilation system is provided with heat recovery.

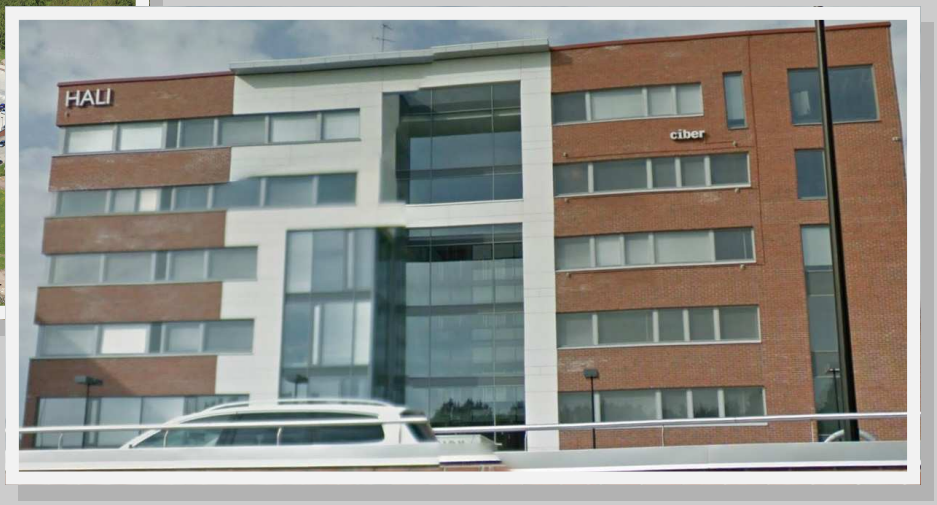
Finnish regulation have requirements for construction materials, thermal insulation factors and heat penetration factor. The Finnish buildings are welcomed comparing the national building code minimum levels for thermal insulation factors with the building in final status. GreenBuilding agreed on this procedure.

In this case the demanded U value amounts to 0,48 W/m^2/K, while the Koy Falcon Hali achieved 0,35W/m^2/K.

The percentage saving is of 25.9%

Technical Data

Building use	**Office**
Area	**10.748 m²**
PEC before or reference value	/
PEC	**153,20 kWh/m²y**
Energy savings %	**25.9 %**
Absolute savings	/
Financial info	/



Partner: Aberdeen Asset Management

Building: Koy Falcon Lago

GreenBuilding : 2012

Project: New Building

Address: Vaisalantie 4, 2130 - Espoo

Country : Finland

Building Description and Technical Measures

This office building also includes an auditorium and a gym. In the basement there is a parking space and a car wash. The building is heated by radiators and a ventilation system and cooled by ventilation and cooling beams. The heating plant is connected to district heating and the cooling plant is supplied by air-water heat pump; windows are equipped with selective glazing in southern and western façade.

Finnish regulation have requirements for construction materials, thermal insulation factors and heat penetration factor. The Finnish buildings are welcomed comparing the national building code minimum levels for thermal insulation factors with the building in final status. GreenBuilding agreed on this procedure.

In this case the demanded U value amounts to 0,45 W/m2/K, while the Koy Falcon Lago achieved 0,32W/m2/K.

The percentage saving is of 28.8%

Technical Data

Building use	**Office**
Area	**13.493 m²**
PEC before or reference value	/
PEC	**95,10 kWh/m²y**
Energy savings %	**28.8 %**
Absolute savings	/
Financial info	/

Partner: Aberdeen Asset Management

Building: Koy Falcon Tinnu

GreenBuilding : 2012

Project: New Building

Address: Vaisalantie 4, 2130 - Espoo

Country : Finland

Building Description and Technical Measures

The building is heated by radiators and a ventilation system and cooled by ventilation and cooling beams. The heating plant is connected to district heating and the cooling plant is supplied by air-water heat pump; windows are equipped with selective glazing in southern and western façade.

Finnish regulation have requirements for construction materials, thermal insulation factors and heat penetration factor. The Finnish buildings are welcomed comparing the national building code minimum levels for thermal insulation factors with the building in final status. GreenBuilding agreed on this procedure.

In this case the demanded U value amounts to 0,51 W/m2/K, while the Koy Falcon Tinnu achieved 0,38W/m2/K.

The percentage saving is of 25.5%

Technical Data

Building use	**Office**
Area	**9.372 m²**
PEC before or reference value	/
PEC	**130,30 kWh/m²y**
Energy savings %	**25.5 %**
Absolute savings	/
Financial info	/

Partner: Aberdeen Asset Management

Building: Lilla Katrineberg 4

GreenBuilding : 2012

Project: Refurbishment

Address: Katrinebergsbacken 35, 11761 - Stockholm

Country : Sweden

Building Description and Technical Measures

The building consists of 4 floors, where 2 floors are offices and 2 floors are parking garage. The building is heated by the ventilation system and cooled by ventilation and cooling beams. The heating plant is of type district heating and the cooling plant is a compressor cooling machine. The energy saving measures that have been executed include adjustments in the control system on supply of heating and cooling to prevent heating against cooling, improved heating recovery on the ventilation system, CO2 control on ventilation flow in offices and decreased temperature in the parking garage. The company has also trained maintenance staff to further decrease the energy usage.

Technical Data

Building use	**Office**
Area	**4.960 m²**
PEC before or reference value	**142,72 kWh/m²y**
PEC	**106,27 kWh/m²y**
Energy savings %	**25,54 %**
Absolute savings	**180.823,00 kWh/y**
Financial info	/

Partner: Akademiska Hus Region Stockholm

Building: Aula Medica A0095080

GreenBuilding : 2013

Project: New building

Address: Nobels väg 6, 17165 - Solna

Country : Sweden

Building Description and Technical Measures

This building hosts an auditorium, offices, conference rooms and a restaurant. Its façade mainly consists of curtains wall which is a combination of wall panels and glass panels. Heat losses and thermal joints have been calculated through energy models for high performance. Average value for the construction is 0,46 W/m^2/K. The building is supplied by district heating, which includes both comfort heating and services hot water. The purchased heat is transferred to the building's energy central, which mainly consists of a heat exchanger and a control system. Outdoor air that enters air handling units is first preheated with an energy recovery exchanger located in the return air. Cooling is purchased from district cooling. Inside the building the chilled water is used to distribute the cooling for different uses. Installed power for lighting is less than 8 W/m^2, or 100 kW for the whole building. The ventilation system is equipped with heat recovery (80% of efficiency).

Technical Data

Building use	**Office**
Area	**13.200 m²**
PEC before or reference value	**103,0 kWh/m²y**
PEC	**73,0 kWh/m²y**
Energy savings %	**29,1 %**
Absolute savings	**396.000,00 kWh/y**
Financial info	**/**

Partner: Alecta Pensionsförsäkring

Building: Göteborg Gullbergsvass 4:2 – Kilsgatan 1-9

GreenBuilding : 2013

Project: Refurbishment

Address: Göteborg

Country : Sweden

Building Description and Technical Measures

The property Göteborg Gullbergsvass 4:2 is situated in the city centre of Gothenburg. It was built in 1982 and has 6 floors of which one floor is a garage. The building hosts mostly offices but on the ground floor there is also a restaurant. It is connected to Göteborg Energi's district heating and district cooling network. It is ventilated by 7 ventilation system. The following measures have been adopted to achieve energy saving goals: calibration of automation system and airflow adjustment on the ventilation system; substitution of thermo valves and adoption of new lighting system in the garage.

Technical Data

Building use	**Office**
Area	**15.500 m²**
PEC before or reference value	**190,30 kWh/m²y**
PEC	**127,40 kWh/m²y**
Energy savings %	**33,1 %**
Absolute savings	**974.950,00 kWh/y**
Financial info	/

Partner: BASF SE

Building: Building B016

GreenBuilding 2013

Project: New Building

Address: Carl-Bosch-Strasse 38, 67056 - Ludwigshafen

Country: Germany

Building Description and Technical Measures

The newly constructed bathhouse is located on the factory premises of BASF in Ludwigshafen / Germany. The intended purpose of the building is to provide a possibility for BASF employees to take a shower and get changed after a work shift. Thus, the building provides approx. 4,000 lockers, 250 showers, 150 sinks and 30 toilets on 5 floors. The building is supplied by district heating and the ventilation system is provided with heat recovery. The lighting system is equipped with efficient fluorescent lamps and occupancy linking control. Energy consumption is monitored with a Building Energy Monitoring System.

Technical Data

Building use	**Other (Changing facility)**
Area	**7.637 m²**
PEC before or reference value	**244,00 kWh/m²y**
PEC	**180,00 kWh/m²y**
Energy savings %	**26,4 %**
Absolute savings	**488.768 kWh/y**
Financial info	/

Partner: Beidaihe New District Ltd.

Building: Beidaihe New District Hotel B5

GreenBuilding 2013

Project: New Building

Address: East seashore road, 66311 - Qinhuangdao city

Country: China

Building Description and Technical Measures

The building is a governmental hotel in the Beidaihe New district, which is the first demo area for Eco development in Hebel province, approved by China Ministry of construction. This building is designed to be a show case. Many energy saving measures has been adopted. The glazing standard – double unit – and the insulation of the building are much higher than local ones. Envelope average U value amount to 0,32 W/m^2/K. The ground source heat pump with thermal storage is designed to cover 85% of heating and cooling energy demand. The peak heating demand will be covered by an electrical boiler and the peak cooling demand will be delivered by the heat pump running at Ac mode. The ventilation plant is provided with heat recovery (75% efficiency). Unwanted solar gains are avoided through well sized external shading devices. All energy consumption are monitored with a BEMS (Building Energy Management System).

Technical Data

Building use	**Hotel & Accommodation**
Area	**3.962 m^2**
PEC before or reference value	**224,50 kWh/m^{2}y**
PEC	**137,30 kWh/m^{2}y**
Energy savings %	**38,8 %**
Absolute savings	**345.427,00 kWh/y**
Financial info	/

Partner: Bau-und Liegenschaftsbetrieb NRW, NL Münster

Building: GEO I – Institute of Geography

GreenBuilding 2013

Project: New Building

Address: Heisenbergstr. 2, 48149 Münster

Country: Germany

Building Description and Technical Measures

The new building of the Institute for Geography of the University of Münster has a square footprint with side lengths of approx. 40 meter each. It consist of a basement level and six floors levels over ground. The main entrance, on the south side of the building, leads to two atrium in the centre of the building which connect the different functional areas as seminar rooms, offices, laboratories and a library. The building has been constructed in a reinforced concrete structure, with concrete floors and ventilated curtain wall. The roof is accessible for maintenance reasons. The roof which covers the two atriums is made of glass. The envelope average U value amounts to 0,48 W/m^2/K.

The central heating system of the building is supplied by district heating. A solar thermal plant, located on the top of the roof, supports the provision of sanitary hot water. The cooling system is equipped with a water-water heat pump. The ventilation system is provided with heat recovery. The building is also equipped with a photovoltaic plant.

Control systems have been adopted in order to reduce energy consumption as occupancy linking control and activation of night draw-down on the heating system.

Technical Data

Building use	**Education**
Area	**9.958 m^2**
PEC before or reference value	**115,90 kWh/m^{2}y**
PEC	**82,70 kWh/m^{2}y**
Energy savings %	**28,60 %**
Absolute savings	**331.004,00 kWh/y**
Financial info	/

Partner: Bockasjö AB

Building: Nyhagshuset 2

GreenBuilding 2013

Project : New Building

Address: Mineralgatan 7, Helsingborg

Country: Sweden

Building Description and Technical Measures

E4 Terminalen is a combined storage and office building. The office area amounts to 1.443 m^2 and the storage area to 28.307 m^2.The building is heated by district heating and has a hydronic heating system with zone control. The office area is equipped with a chiller for airborne cold. The control and regulation system is with remote access. The building envelope consists of both sheet metal and plaster façade. The slab on the ground is made of concrete and high performance insulation. The average U value for the envelope is 0,25 W/m^2/K. The ventilation system is provided with heat recovery (80% efficiency). Presence detectors for lighting are installed in changing rooms and toilets.

The policy of the company involves all personnel in the operations in order to work as a team with high awareness of energy issues. The all staff will work with long term thinking in management in the choice on energy type, operation and maintenance and in the impact that this provides.

Technical Data

Building use	**Logistics & Storage**
Area	**29.750 m²**
PEC before or reference value	**80,00 kWh/m²y**
PEC	**41,00 kWh/m²y**
Energy savings %	**48,00 %**
Absolute savings	**1.160.250,00 kWh/y**
Financial info	/

Partner: Brockmann & Brockmann GbR mbH

Building: Verwaltung MYK BA2

GreenBuilding : 2013

Project: New Building

Address: August-Horch-Str. 5, 56736 - Kottenheim

Country : Germany

Building Description and Technical Measures

This new construction is a two-storey office building for Brockmann & Brockmann GbR mbH. The building envelope is very well insulated; especially the windows are about 35% better than the legal reference value in force and are provided with external shading. A ground source heat pump provides the whole building with low temperature water. Conference rooms and offices are equipped with a ventilation system with heat recovery (90% efficiency) and heating/cooling function.

Technical Data

Building use	**Office**
Area	**758,40 m²**
PEC before or reference value	**212,20 kWh/m²y**
PEC	**148,00 kWh/m²y**
Energy savings %	**30,3 %**
Absolute savings	**48.692,00 kWh/y**
Financial info	**€156.500,00**

Partner: Centrovox Kabelvertriebs-Gesellschaft m.b.H.

Building: Office Building Centrovox

GreenBuilding : 2012

Project: New Building

Address: Senefelderstrasse 1, A-2100 - Leobendorf

Country : Austria

Building Description and Technical Measures

The new office building of Centrovox Kabelvertriebs-Gesellschaft m.b.H. was constructed with special attention on reduced heat losses via an optimized thermal envelope (compact shape, low U-Values of external walls/roof/basement, triple low-e-glazing) and on energy efficient building services. Heating is supplied by a water-to-water heat pump (in combination with floor and ceiling heating). Cooling demand is reduced by moveable external shading devices. Free Cooling can be provided by ground water, the ceilings are used for cooling. The office building is equipped with a mechanical air supply and exhaust system including high-efficient heat recovery (rotary heat exchanger).

Technical Data

Building use	**Office**
Area	**1.032,70 m²**
PEC before or reference value	**47,33 kWh/m²y**
PEC	**21,69 kWh/m²y**
Energy savings %	**54,17 %**
Absolute savings	**26.479,90 kWh/y**
Financial info	/

Partner: CRI filial till Commerz Real Investmentgesellschaft mbH

Building: Danderyd Djursholm 2:438, byggnad 1

GreenBuilding 2012

Project : New Building

Address: Enebybergsvägen, 182 36 - Danderyd

Country: Sweden

Building Description and Technical Measures

The building has an approximately quadrangular plan, with a north-eastern façade, and has southeast and northeast adjacent buildings. It comprises 6 floors above ground which integrates office spaces, training rooms, library, dining room, toilet facilities, equipment and storage rooms; and a basement floor, dedicated to access and technical area of the elevator. Generation of thermal energy (hot and cold water), through two heat pumps with air-water recovery, 4-pipe, with hydraulic group built-in, and a nominal power of 47,4/58,7 kW, in heating, and 40,6 kW in cooling. Terminal equipment (fan coil unit and auditorium handling air unit), which promotes the controlled transfer of thermal energy into spaces (in order to ensure control of thermal conditions). The autonomous climate unit of direct expansion, type split, promotes the acclimatization of a technical area, with a cooling and heating thermal power of 4,1 kW and 3,48 kW, respectively. Diverse ventilation equipment (fans, cross flow ventilation units and auditorium handling air unit), which ensure the inflation of outside air and/or air extraction in several areas of the building.

Technical Data

Building use	**Wholesale & Retail**
Area	**12.146 m²**
PEC before or reference value	**120,00 kWh/m²y**
PEC	**72,00 kWh/m²y**
Energy savings %	**40 %**
Absolute savings	**583.008,00 kWh/y**
Financial info	/

DAIMLER

Partner: Daimler AG

Building: Haus Lämmerbuckel

GreenBuilding 2012

Project: Refurbishment

Address: Lämmerbuckel 6, 73349 - Wiesensteig

Country: Germany

Building Description and Technical Measures

The building is used as a qualification centre with accommodation for employees of Mercedes-Benz. The building is divided into four parts and all of them are considered in the renovation measure. The swimming pool area and the gym with the changing rooms and sanitary rooms its one part. The second part and the third part are the two different types of sleeping rooms and the kitchen inclusive the dining hall. The last part are the several types of seminar rooms. The heating system is equipped with methane boiler and centralized mechanical cooling plant. Windows are fitted with mobile external shading devices to avoid unwanted solar gains. The ventilation system is equipped with a heat recovery system. The lighting system has been improved, new efficient lamps have been installed.

Technical Data

Building use	**Hotel & Accommodation**
Area	**12.115 m²**
PEC before or reference value	**192,00 kWh/m²y**
PEC	**262,00 kWh/m²y**
Energy savings %	**26,72 %**
Absolute savings	**848.050,00 kWh/y**
Financial info	/

Partner: dm-drogerie markt GmbH & Co.KG

Building: Drogeriefachmarkt

GreenBuilding 2013

Project : New Building

Address: Steinbeisstraße 1, 71229 - Leonberg

Country: Germany

Building Description and Technical Measures

Dm-drugstore market is committed to contribute to the reduction of the use of fossil energy and to improve the performance of their building using state of the art technologies. This retail store located in Karlsruhe uses a combined heat pump/ air conditioning system. In the summer is cooled with an air conditioning system and air is also dehumidified. The heating system is equipped with a condensing gas boiler. Ventilation plant is provided with heat recovery (80% efficiency). The building is also provided with a photovoltaic plant. Envelope insulation is improved and thermal bridges have been localised and eliminated. For the lighting system efficient fluorescent lamps have been chosen. Dm-drugstore market monitors the energy consumption using a central internet based platform.

Technical Data

Building use	**Wholesale & Retail**
Area	**945 m²**
PEC before or reference value	**239,20 kWh/m²y**
PEC	**109,70 kWh/m²y**
Energy savings %	**54,10 %**
Absolute savings	**122.409,00 kWh/y**
Financial info	**€ 142.000**

Partner: Dolomiti Real Slovakia, k.s.

Building: Bratislava Logistic Park – Hall C

GreenBuilding 2013

Project : New Building

Address: Dialnicna Cesta 4796, SK-90301 - Senec

Country: Slovakia

Building Description and Technical Measures

This project concerns a new logistic building with total 36.600 m^2 store space (warehouse) and office area, with a flexible rent-space from 4.000 to 36.600 m^2. Clear height for storage is 10,5 m. To achieve low running costs, very high performing construction material and insulation have been used. Heating for store-house is supplied by dark-gas-fired infrared heaters installed on the roof structure. For the office area heats comes from gas-fired condensing boiler with radiators. Lighting system is equipped with high efficiency lamps with manual control.

Technical Data

Building use	**Logistics & Storage**
Area	**39.132 m²**
PEC before or reference value	**340,00 kWh/m²y**
PEC	**143,00 kWh/m²y**
Energy savings %	**45,70 %**
Absolute savings	**7.720.824,00 kWh/y**
Financial info	/

Partner: Dustmann & Co.KG

Building: Dula Hauptverwaltung und Kaufhaus Dustmann

GreenBuilding 2013

Project : Refurbishment

Address: Harkortstraße 25-27, 44225 - Dortmund

Country: Germany

Building Description and Technical Measures

The building was built in 1970 and is located in the middle of the Hombruch District, in the city of Dortmund. The refurbishment includes a complete renewal of the envelope and of the roof on which has been placed a new the thermal insulation (average U-value: 0,75 W/ m^2/K). The windows are provided with clear double glazed unit. Also the existing heating and ventilation system has been fundamentally renewed. A tri-cogeneration plant, in combination with a wood pellet plant, has replaced the old technology. The cooling system is equipped with an air-water heat pump. The ventilation system is provided with heat recovery (81% efficiency). The building is also supplied by renewable sources through a photovoltaic plant. The lighting system is equipped with LEDs technology.

Technical Data

Building use	**Wholesale & Retail**
Area	**8.366 m²**
PEC before or reference value	**248,70 kWh/m²y**
PEC	**171,20 kWh/m²y**
Energy savings %	**31 %**
Absolute savings	**645.806,00 kWh/y**
Financial info	/

Partner: EDEKA Handelsgesellschaft Südwest mbH

Buildings: Lebensmittelmarkt Bodman-Ludwigshafen[1], Brackenheim[2], Ditzingen[3], Eschach[4]

GreenBuilding 2012

Project : New Buildings

Country: Germany

Building Description and Technical Measures

19 new buildings hosting EDEKA supermarkets subscribed in 2012. The Company policy is based on sustainability including environmental issues, staffing and merchandise. The Company buildings are planned for a long term use between 15-20 year and all calculations include energy considerations. The main measures adopted in the EDEKA buildings are the followings:

Technical Data

Building use	**Wholesale & Retail**
Area	**1.635** 1, **2.388** 2, **4.284** 3, **1.874** 4 **m²**
PEC before or reference value	**182,32** 1, **298,12** 2, **268,15** 3, **159,94** 4, **kWh/m²y**
PEC	**123,79** 1, **201,71** 2, **197,96** 3, **102,89** 4, **kWh/m²y**
Energy savings %	**31,57 % (average)**
Absolute savings	**733.549,00 kWh/y (total)**
Financial info	/

Ditzingen

Bodman-Ludwigshafen

Partner: EDEKA Handelsgesellschaft Südwest mbH

Buildings: Lebensmittelmarkt Flonheim[1], Freiburg[2], Geisenheim[3], Hassloch[4]

GreenBuilding 2012

Project : New Buildings

Country: Germany

Building Description and Technical Measures

These new buildings host EDEKA supermarkets subscribed in 2012. The Company policy is based on sustainability including environmental issues, staffing and merchandise. The Company buildings are planned for a long term use between 15-20 year and all calculations include energy considerations.

Technical Data

Building use	**Wholesale & Retail**
Area	**1.714** 1, **4.063** 2, **1.832** 3, **2.095** 4 **m²**
PEC before or reference value	**168,25** 1, **124,15** 2, **158,50** 3, **158,38** 4, **kWh/m²y**
PEC	**113,47** 1, **85,03** 2, **111,00** 3, **92,16** 4, **kWh/m²y**
Energy savings %	**33,96 % (average)**
Absolute savings	**478.564,00 kWh/y (total)**
Financial info	/

Freiburg

Hassloch

Flonheim

Partner: EDEKA Handelsgesellschaft Südwest mbH

Buildings: Lebensmittelmarkt Hirschberg[1], Murg[2], Oberkochen[3], Oedheim[4]

GreenBuilding 2012

Project : New Buildings

Country: Germany

Building Description and Technical Measures

These new buildings host EDEKA supermarkets subscribed in 2012. The Company policy is based on sustainability including environmental issues, staffing and merchandise. The Company buildings are planned for a long term use between 15-20 year and all calculations include energy considerations.


Hirschberg

Oberkochen

Technical Data

Building use	**Wholesale & Retail**
Area	**1.405** 1, **1.627** 2, **2.028** 3, **1.607** 4 **m²**
PEC before or reference value	**124,43** 1, **321,32** 2, **158,50** 3, **158,38** 4, **kWh/m²y**
PEC	**85,52** 1, **220,86** 2, **101,47** 3, **91,00** 4, **kWh/m²y**
Energy savings %	**34,8 % (average)**
Absolute savings	**108.839,50 kWh/y (total)**
Financial info	/

Oedheim

Murg

Partner: EDEKA Handelsgesellschaft Südwest mbH

Buildings: Lebensmittelmarkt Ostrach[1], St. Blasien[2], Willstätt[3]

GreenBuilding 2012

Project : New Buildings

Country: Germany

Building Description and Technical Measures

These new buildings host EDEKA supermarkets subscribed in 2012. The Company policy is based on sustainability including environmental issues, staffing and merchandise. The Company buildings are planned for a long term use between 15-20 year and all calculations include energy considerations.


Ostrach

Technical Data

Building use	**Wholesale & Retail**
Area	**1.768** 1, **2.066** 2, **2.132** 3 **m²**
PEC before or reference value	**175,18** 1, **131,64** 2, **155,52** 3 **kWh/m²y**
PEC	**124,29** 1, **93,20** 2, **100,83** 3 **kWh/m²y**
Energy savings %	**31,17 % (average)**
Absolute savings	**206.335,00 kWh/y (total)**
Financial info	/


St. Blasien

Willstätt

Partner: EDEKA Handelsgesellschaft Südwest mbH

Building: EDEKA Lebensmittelmarkt Backnang

GreenBuilding 2013

Project : New Building

Address: Gartenstraße 76, 71522 - Backnang

Country: Germany

Building Description and Technical Measures

This new building hosts an EDEKA supermarket. The Company policy is based on sustainability including environmental issues, staffing and merchandise. The Company buildings are planned for a long term use between 15-20 year and all calculations include energy considerations.

In this building in order to improve the microclimate the roof (more than 2.700m^2) is greened. The market is equipped with highly energy efficient LED-lights. The heating system is equipped with a gas fired condensing boiler. On this system a night drawdown and a week end drawdown regulation is active. Heat is supplied by district heating. The cooling system is equipped with room air-conditioner; external shading helps the cooling strategy. The ventilation plant is provided with heat recovery.

Technical Data

Building use	**Wholesale & Retail**
Area	**3.098 m²**
PEC before or reference value	**192,00 kWh/m²y**
PEC	**135,20 kWh/m²y**
Energy savings %	**29,6 %**
Absolute savings	**176.104,00 kWh/y**
Financial info	**€ 109.680,00**

Partner: EDEKA Handelsgesellschaft Südwest mbH

Building: EDEKA Lebensmittelmarkt Bermatigen

GreenBuilding 2013

Project : New Building

Address: Jahnstrasse, 88697 - Bermatingen

Country: Germany

Building Description and Technical Measures

This new retail building has a supporting structure made of wooden beams, while insulated metal plate panels are used to load the construction system. The internal space is furbished with a suspended ceiling. The whole sales area is equipped with highly energy efficient LED-lighting. The building is supplied by district heating. The heating system is equipped with a condensing boiler provided with a heat recovery system and with outdoor temperature regulation. Well dimensioned heat pumps with power regulation and thermostatic radiator valves have been installed. Night and week-end drawdown system is active. The envelope has an U-value of 0,28 W/m^2/K. In order to reduce unwanted solar heat gains, windows are provided with manual mobile shading devices.

Technical Data

Building use	**Wholesale & Retail**
Area	**1.056 m²**
PEC before or reference value	**164,30 kWh/m²y**
PEC	**119,30 kWh/m²y**
Energy savings %	**27,1 %**
Absolute savings	**48.008,00 kWh/y**
Financial info	/

Partner: EDEKA Handelsgesellschaft Südwest mbH

Building:EDEKA Lebensmittelmarkt Billigheim-Ingenheim

GreenBuilding 2013

Project : New Building

Address: Firststraße, 76831 - Billigheim-Ingenheim

Country: Germany

Building Description and Technical Measures

The heating as well as the cooling of the building is provided by a geothermal system. In this way the use of fossil fuels can be completely avoided. The heating plant is provided with a low temperature boiler; the system has an outdoor-temperature regulation and thermostatic valves. Process heat for cooling is recovered by a heat recovery system. Energy efficient fluorescent tubes are used in the whole building for the lighting. Windows are equipped with manual mobile external shading.

Technical Data

Building use	**Wholesale & Retail**
Area	**1.994 m²**
PEC before or reference value	**196,20 kWh/m²y**
PEC	**128,70 kWh/m²y**
Energy savings %	**34,4 %**
Absolute savings	**134.704,00 kWh/y**
Financial info	**195.000 Euro**

Partner: EDEKA Handelsgesellschaft Südwest mbH

Building: EDEKA Lebensmittelmarkt Dettenhausen

GreenBuilding 2013

Project : New Building

Address: Tübinger Straße, 72135 - Dettenhausen

Country: Germany

Building Description and Technical Measures

This new building hosts an EDEKA supermarket. The Company policy is based on sustainability including environmental issues, staffing and merchandise. The Company buildings are planned for a long term use between 15-20 year and all calculations include energy considerations.

In this building in order to improve the microclimate the roof (more than 1.800 m^2) is greened. The heating as well as the cooling is provided by a geothermal system. The heating system is equipped with an electric heat pump and with a low temperature boiler. On this system a night drawdown and a week end drawdown regulation is active. The cooling is equipped with a ground source heat pump; external shading helps the cooling strategy. The ventilation plant is provided with heat recovery.

Technical Data

Building use	**Wholesale & Retail**
Area	**1.723 m²**
PEC before or reference value	**189,40 kWh/m²y**
PEC	**128,20 kWh/m²y**
Energy savings %	**32,3 %**
Absolute savings	**105.329,00 kWh/y**
Financial info	**€ 222.476,00**

Partner: EDEKA Handelsgesellschaft Südwest mbH

Building: EDEKA Lebensmittelmarkt Ellwangen

GreenBuilding 2013

Project : New Building

Address: Konrad-Adenauer-Straße, 73479 - Ellwangen

Country: Germany

Building Description and Technical Measures

This new building hosts an EDEKA supermarket. The Company policy is based on sustainability including environmental issues, staffing and merchandise. The Company buildings are planned for a long term use between 15-20 year and all calculations include energy considerations.

In this building in order to improve the microclimate the roof (more than 900m2) is greened. The market is equipped with highly energy efficient LED-lights. The heating as well as the cooling is provided by a geothermal system. The heating system is equipped with an electric heat pump and with a low temperature boiler. On this system a night drawdown and a week end drawdown regulation is active. The cooling is equipped with a ground source heat pump; external shading helps the cooling strategy. The ventilation plant is provided with heat recovery.

Technical Data

Building use	**Wholesale & Retail**
Area	**1.676 m²**
PEC before or reference value	**207,00 kWh/m²y**
PEC	**129,70 kWh/m²y**
Energy savings %	**37,4 %**
Absolute savings	**129.619,00 kWh/y**
Financial info	**€ 148.000,00**

Partner: EDEKA Handelsgesellschaft Südwest mbH

Building: EDEKA Lebensmittelmarkt Löchgau

GreenBuilding 2013

Project : New Building

Address: Lise-Meitner-Straße, 74369 - Löchgau

Country: Germany

Building Description and Technical Measures

This new retail building is an energy optimized building. It is equipped with a geothermal system, which allows heating and cooling without using fossil fuels. The geothermal system is a vertical closed loop field with 75 kW of installed power. A low temperature boiler is installed, equipped with an out-door regulation system. The heating circuits have been optimized. Well dimensioned heating pumps with power regulation and thermostatic valves have been also installed. Night and week-end drawdown are both active. Over the 50% of the roof is greened, in order to improve the microclimate of the sale area. The heating production system is provided with an electric heat pumps and the ventilation plant with heat recovery system.

Technical Data

Building use	**Wholesale & Retail**
Area	**1.056 m²**
PEC before or reference value	**164,30 kWh/m²y**
PEC	**119,30 kWh/m²y**
Energy savings %	**27,1 %**
Absolute savings	**48.008,00 kWh/y**
Financial info	/

Partner: EDEKA Handelsgesellschaft Südwest mbH

Building: EDEKA Lebensmittelmarkt Nohfelden-Türkismühle

GreenBuilding 2013

Project : New Building

Address: Saarbrücker Straße, 66625 - Nohfelden-Türkismühle

Country: Germany

Building Description and Technical Measures

The heating as well as the cooling of the building is provided by a geothermal system. In this way the use of fossil fuels can be completely avoided. The heating plant is provided with a heat pump; the system has an outdoor-temperature regulation and thermostatic valves. Process heat for cooling is recovered by a heat recovery system. Energy efficient fluorescent tubes are used in the whole building for the lighting. Windows are equipped with manual mobile external shading.

Technical Data

Building use	**Wholesale & Retail**
Area	**1.994 m²**
PEC before or reference value	**192,70 kWh/m²y**
PEC	**128,90 kWh/m²y**
Energy savings %	**33,4 %**
Absolute savings	**128.573,00 kWh/y**
Financial info	**€ 189.000**

Partner: EDEKA Handelsgesellschaft Südwest mbH

Building: EDEKA Lebensmittelmarkt Oberursel

GreenBuilding 2012

Project : New Building

Address: Frankfurter Landstrasse 150, 61440 - Oberursel - Weisskirchen

Country: Germany

Building Description and Technical Measures

The supermarket in Oberursel-Weisskirchen on the Frankfurter Landstrasse will be available to residents at the end of 2012 as a full supplier. The retail area is nearly 1.965m², the total area of about 2.725 m² and is distributed over 2 floors. The solid constructed building together with the delivery area is equipped with a green flat roof supported by a reinforced concrete girder construction. The cantilevered upper floor is running with a metal facade. The entrance area is roofed by separated steel structure standing in front of the building. The rainwater is partially collected in a cistern and used to irrigate the green areas, and the rest is being passed under control to the sewers. After completion of the store there will be 150 parking spaces available for the customers.

Technical Data

Building use	**Wholesale & Retail**
Area	**2.434 m²**
PEC before or reference value	**188,39 kWh/m²y**
PEC	**116,74 kWh/m²y**
Energy savings %	**38,03 %**
Absolute savings	**174.391,00 kWh/y**
Financial info	**€ 207.641,00**

Partner: EDEKA Handelsgesellschaft Südwest mbH

Building: EDEKA Lebensmittelmarkt Oftersheim

GreenBuilding 2013

Project : New Building

Address: Eichendorffstraße 44, 68723 - Oftersheim

Country: Germany

Building Description and Technical Measures

This new retail building is an energy optimized building. It is equipped with a geothermal system, which allows heating and cooling without using fossil fuels. The geo-thermal system is an open loop system with 105 kW of installed power. A low temperature boiler is installed, equipped with an out-door regulation system. The heating circuits have been optimized. Well dimensioned heating pumps with power regulation and thermostatic valves have been also installed. Night and week-end drawdown are both active. The heating production system is provided with an electric heat pumps and the ventilation plant with heat recovery system. The sales area of the market is lightened entirely with energy efficient LED-lamps.

Technical Data

Building use	**Wholesale & Retail**
Area	**2.120 m²**
PEC before or reference value	**179,60 kWh/m²y**
PEC	**121,60 kWh/m²y**
Energy savings %	**32,3 %**
Absolute savings	**122.984,00 kWh/y**
Financial info	/

Partner: EDEKA Handelsgesellschaft Südwest mbH

Building: EDEKA Lebensmittelmarkt Rastatt-Rheinau

GreenBuilding 2013

Project : New Building

Address: Buchenstraße, 76437 - Rastatt-Rheinau

Country: Germany

Building Description and Technical Measures

This new building hosts an EDEKA supermarket. The Company policy is based on sustainability including environmental issues, staffing and merchandise. The Company buildings are planned for a long term use between 15-20 year and all calculations include energy considerations.

In this building in order to improve the microclimate the roof (more than 2.000m^2) is greened. The heating as well as the cooling is provided by a geothermal system. The heating system is equipped with an electric heat pump and with a low temperature boiler. On this system a night drawdown and a week end drawdown regulation is active. The cooling is equipped with a ground source heat pump; external shading helps the cooling strategy. The ventilation plant is provided with heat recovery.

Technical Data

Building use	**Wholesale & Retail**
Area	**1.972 m²**
PEC before or reference value	**180,70 kWh/m²y**
PEC	**126,30 kWh/m²y**
Energy savings %	**30,1 %**
Absolute savings	**107.209,00 kWh/y**
Financial info	**€ 190.680,00**

Partner: EDEKA Handelsgesellschaft Südwest mbH

Building: EDEKA Lebensmittelmarkt Sasbach am Kaiserstuhl

GreenBuilding 2013

Project : Refurbishment

Address: Alemannenstraße 5, 79361 - Sasbach am Kaiserstuhl

Country: Germany

Building Description and Technical Measures

This supermarket has been completely redesigned, modernized and equipped with the latest technology concerning heating, refrigeration, ventilation and electrical devices. The envelope insulation has been improved and the rate transparent/opaque has been reduced: average U value amounts to 0,7 W/m^2/K. The heating system is equipped with a heat pump and additionally heat recovery is provided from the refrigeration plant. A Tri/cogeneration plant has also been installed. Windows are equipped with external shading devices. Fluorescent lamps have replaced inefficient ones. Occupancy linking controls have been introduced. All energy consumptions are monitored with a BEMS.

Technical Data

Building use	**Wholesale & Retail**
Area	**1.700 m²**
PEC before or reference value	**794,50 kWh/m²y**
PEC	**489,50 kWh/m²y**
Energy savings %	**34,6 %**
Absolute savings	**554.170,00 kWh/y**
Financial info	/

Partner: EDEKA Handelsgesellschaft Südwest mbH

Building: EDEKA Lebensmittelmarkt Schönau

GreenBuilding 2013

Project : New Building

Address: Greinerstraße, 69250 - Schönau

Country: Germany

Building Description and Technical Measures

This new retail building is a massive construction made of laminated beams. The secondary spaces and the delivery area are covered by a flat roof, which is bearing on a steel construction with trapezoidal sheets. A geothermal system allows the heating and the cooling of the building without using fossil fuels. The heating production system is provided with electric heat pump and a low temperature boiler with out-door temperature regulation. Night and week-end drawdown system is active. The ventilation plant is equipped with a heat recovery system. External shading on windows sustains the cooling strategy based on the ground source heat pump (open loop system with 70 kW of installed power). Rainwater will be collected by a storage conduit. Only wastewater arrives into public sewage water system.

Technical Data

Building use	**Wholesale & Retail**
Area	**1.617 m²**
PEC before or reference value	**201,30 kWh/m²y**
PEC	**131,70 kWh/m²y**
Energy savings %	**36,6 %**
Absolute savings	**112.579,00 kWh/y**
Financial info	/

Partner: EDEKA Handelsgesellschaft Südwest mbH

Building: EDEKA Lebensmittelmarkt Staufen im Breisgau

GreenBuilding 2013

Project : New Building

Address: Gewerbestraße, 79219 - Staufen im Breisgau

Country: Germany

Building Description and Technical Measures

This building hosts a retail market. In order to improve the micro-climate, more than 1.400 m^2 of the roof are greened. The 80-90% of the heating energy is covered by a thermodynamic system: the waste heat of the re-frigeration plant is covered by a heat pump. Peaks are covered by a condensing boiler supplied by natural gas. The heating system is equipped with thermostatic valves. The waste heat is also used for the hot water generation. Windows are provided with manual mobile external shading. A night-drawdown system and a week -end drawdown system are active.

Technical Data

Building use	**Wholesale & Retail**
Area	**1.951,20 m²**
PEC before or reference value	**217,50 kWh/m²y**
PEC	**142,20 kWh/m²y**
Energy savings %	**34,6 %**
Absolute savings	**146.888,00 kWh/y**
Financial info	/

Partner: EDEKA Handelsgesellschaft Südwest mbH

Building: EDEKA Lebensmittelmarkt Viernheim

GreenBuilding 2013

Project : New Building

Address: Heidelberger Straße 48, 68519 - Viernheim

Country: Germany

Building Description and Technical Measures

This EDEKA retail store has an area of 2.535 m^2. The heating as well as the cooling of the building is provided by a geothermal system; in this way the use of fossil fuel can be completely relinquished. Process heat for cooling is recovered by a heat recovery system. The market is equipped with highly energy efficient LED-lights. In order to improve the microclimate of the building, the roof is partially greened.

Technical Data

Building use	**Wholesale & Retail**
Area	**2.535 m²**
PEC before or reference value	**178,20 kWh/m²y**
PEC	**121,70 kWh/m²y**
Energy savings %	**31,7 %**
Absolute savings	**143.191,00 kWh/y**
Financial info	**€ 120.300,00**

Partner: EDEKA Handelsgesellschaft Südwest mbH

Building: EDEKA Lebensmittelmarkt Wolfach

GreenBuilding 2012

Project : New Building

Address: Hausacher Strasse, 77709 - Wolfach

Country: Germany

Building Description and Technical Measures

The solid-constructed building opens with its slightly inclined, greened monopitch-roof up to the entry-wing. The ancillary spaces which are surrounding the main building are carried out as extensive green roofs for the benefit of a convenient microclimate. The supporting structure of the double pitch-roof is made of laminated wooden beams which are spanned over by insulated metal plate panels as load bearing structure. The interior is planned with a suspended ceiling. For reason of obtaining an ideal floor plan, two separate delivery areas are planned. 125 parking lots will be provided for the customers. Due to the brownfield situation, the parking area will be built with completely impermeable pavement.

Technical Data

Building use	**Wholesale & Retail**
Area	**2.035 m²**
PEC before or reference value	**198,82 kWh/m²y**
PEC	**116,17 kWh/m²y**
Energy savings %	**41,57 %**
Absolute savings	**168.168,00 kWh/y**
Financial info	**€ 202.200,00**

Partner: Eklandia Fastigheter AB

Building: Lindholmen 28:3

GreenBuilding : 2013

Project: New Building

Address: Theres Svenssons gata 7, Göteborg

Country : Sweden

Building Description and Technical Measures

This project concerns an office building of 11.505 m^2. The building is connected to the District heating system. District heating provides energy produced 21% by renewable source (biofuel), 36% from industrial processes and 24% from household waste. The building is also connected to District cooling. For the cooling strategy the building is provided with solar glass with fixed solar shading on the south, west and east side. The ventilation system is based on demand control, depending on number of people in each room. The air conditioning system is equipped with heat exchanger. The lighting system is equipped with low energy lamps (CFL) and with LED technology. Light is controlled by motion detectors and time channels. A control system called Ecopilot enable to save energy by utilizing the incidental heat gain through computers, lighting, personnel; the heat is stored in the wall, floors and ceiling. Ecopilot make use of local weather forecasts to programme and optimize the heating, ventilation and cooling system.

Technical Data

Building use	**Office**
Area	**11.505 m²**
PEC before or reference value	**100,00 kWh/m²y**
PEC	**73,00 kWh/m²y**
Energy savings %	**27 %**
Absolute savings	**310.635,00 kWh/y**
Financial info	/

Partner: Fabege AB

Building: Hägern Mindre 7

GreenBuilding : 2013

Project: Refurbishment

Address: Drottninggatan 27-29 mfl, 1151 - Stockholm

Country : Sweden

Building Description and Technical Measures

This project concerns the refurbishment of an existing building constructed in 1970-1979. It has surface of 11.555 m^2.The building has been renovated in 2011 upgrading its energy efficiency performance. The building hosts mostly offices but also stores. Until 2010 an old ventilation system was active but with no heat recovery, which in the new system has been installed and has an efficiency of 90%. The building is supplied by district heating and cooling. Energy consumption has been reduced of 51%.

Technical Data

Building use	**Office**
Area	**14.555 m²**
PEC before or reference value	**239,00 kWh/m²y**
PEC	**116,00 kWh/m²y**
Energy savings %	**51 %**
Absolute savings	**1.746.600,00 kWh/y**
Financial info	/

Partner: Fastighets AB Briggen

Building: Grusbacken 3

GreenBuilding : 2013

Project: New Building

Address: Mogatan 14, 25464 - Helsingborg

Country : Sweden

Building Description and Technical Measures

The real-estate property Grusbacken 3 is located in Helsingborg, Sweden and is a new edifice built after 2010 with high demands on energy efficiency. Therefore a ventilation system with variable air volume has been chosen and the building envelope is well isolated and pressure tested post construction to find and eliminate thermal bridges. The building's envelope has an average U-value of 0.21 W/m^2/K. The edifice is supplied by district heating and is equipped with efficient heat recovery (80%). The cooling in the building is provided by chillers.

Technical Data

Building use	**Office**
Area	**2.168 m²**
PEC before or reference value	**80,00 kWh/m²y**
PEC	**57,00 kWh/m²y**
Energy savings %	**29 %**
Absolute savings	**23 kWh/m²y**
Financial info	/

Partner: Fastighets AB Briggen

Building: Kvartsen 2

GreenBuilding : 2013

Project: New Building

Address: Skiffervägen 15, 22478 - Lund

Country : Sweden

Building Description and Technical Measures

This new office building is located in Lund and host two different companies. The envelope insulation is improved: windows are equipped with heat mirror double glazed unit and solar control and in some case with triple glazed unit. For heating system a condensing boiler with well dimensioned heating pump has been installed. Other measures taken for efficient energy consumption are: thermostatic valves, activation of night-drawdown and week-end-drawdown, temperature reduction of the hot water boiler. The ventilation system is equipped with heat recovery and air volume is variable. The lighting system is equipped with fluorescent lamps replacing incandescent lamps and electronic ballast. Luminaries with light direction have been introduced, reducing the number of luminaries needed. The system has daylight responsive control. All energy consumption are recorded and monitored with BEMS.

Technical Data

Building use	**Office**
Area	**2.479 m²**
PEC before or reference value	**92,00 kWh/m²y**
PEC	**64,80 kWh/m²y**
Energy savings %	**29,5 %**
Absolute savings	**67.207,00 kWh/y**
Financial info	/

Partner: Fastighets AB Briggen

Building: Topasen I

GreenBuilding 2012

Project: Refurbishment

Address: Andesitgatan 8, Helsingborg

Country: Sweden

Building Description and Technical Measures

The building has a heated area of a 8.735 square meters and is situated in Helsingborg, Sweden. Before the buildings current use, the property was used by a manufacturer of medical equipment. Production rooms achieve very high standard. Several rooms have sound-absorbing ceilings and roof terraces. The premises are bright, with light to enter from both roof windows and windows on the walls. Since virtually the entire property is one floor, it is easy to get a good internal logistics and to adjust the layout of their production flow. Apart from the assembly halls and several laboratories there are distribution warehouses with more than seven meters to the ceiling. Office accommodation with excellent conference facilities and common areas, dining room, dressing room and gym are also available.

Technical Data

Building use	**Manufacturing & Industry**
Area	**8.735 m²**
PEC before or reference value	**417,00 kWh/m²y**
PEC	**289,00 kWh/m²y**
Energy savings %	**30,7 %**
Absolute savings	**1.118.088,00 kWh/y**
Financial info	/

Partner: Fastighets AB Brostaden

Building: Saltmossen 3

GreenBuilding 2013

Project : New Building

Address: Kumla Gårdsväg 23, 14563 - Norsborg

Country: Sweden

Building Description and Technical Measures

Saltmossen 3 is a warehouse building located in Botkyra, south of Stockholm city. The building provides two leases with storage space. It contains the 15% of offices. It is heated by geothermal energy. The ventilation plant is provided with heat recovery (80% of efficiency). Brostaden Company operates with minimal impact on the environment. All action are taken from an environmental perspective, based on life-cycle principles. Every month data are collected from all measures and analysed.

Technical Data

Building use	**Logistics & Storage**
Area	**5.420 m²**
PEC before or reference value	**55,00 kWh/m²y**
PEC	**22,00 kWh/m²y**
Energy savings %	**60 %**
Absolute savings	**178.860,00 kWh/y**
Financial info	/

Partner: Fastighets AB Fleminghörnet

Building: Roddaren 58

GreenBuilding 2013

Project : Reurbishment

Address: Sankt Eriksgatan 44, 112 34 - Stockholm

Country: Sweden

Building Description and Technical Measures

This property was built in 1974 and has seven stories above ground and two stories below ground. The two underground stories consist of mainly car parking and storage areas. The building hosts offices and retails. The building is made of reinforced concrete and has a brick façade. The construction is provided with district heating. The old substation has been replaced in 2011 with a new control system. This was the main measures implemented to achieve energy saving. The building has two electric cooling-devices (chillers) in the basement and is cooled by chilled ventilation air (mechanical ventilation). Roddaren 58 is part of an energy management system according to ISO 50001.

Technical Data

Building use	**Wholesale & Retail**
Area	**14.840 m²**
PEC before or reference value	**136,40 kWh/m²y**
PEC	**101,70 kWh/m²y**
Energy savings %	**25,4 %**
Absolute savings	**514.479,00 kWh/y**
Financial info	/

Partner: Fastighets AB Lastkajen

Building: Domnarvet 10

GreenBuilding : 2013

Project: Refurbishment

Address: Domnarvsgatan 31-33, 163 53 - Spånga

Country : Sweden

Building Description and Technical Measures

This project concerns the refurbishment of an old building constructed in the 70th. The building consists mainly of office spaces and inventory spaces. The refurbishment took place with the goal of archiving new energy efficiency standards. The most important measure taken in 2009, starting year of the intervention, has been the connection of the building to the new district heating system and the installation of new air handling units with a rotary heat exchanger. Also new cooling units have been placed and a new web based regulation system installed.

Technical Data

Building use	**Office**
Area	**4.020 m²**
PEC before or reference value	**150,30 kWh/m²y**
PEC	**89,20 kWh/m²y**
Energy savings %	**40,6 %**
Absolute savings	**245.622,00 kWh/y**
Financial info	**/**

Partner: Fastighets AB Yxkullen

Building: Skjutsgossen 12

GreenBuilding : 2013

Project: Refurbishment

Address: Rosenlundsgatan 5-13, Torkel Knutssonsgatan 22-24, Stockholm

Country : Sweden

Building Description and Technical Measures

This office building is located in Södermalm, Stockholm. It was originally built in 1965 but completely renovated in 1955-1997. Skjutsgossen consists of four building crops which are joined together thus making a nice and green courtyard. Two of the building crops have eight floors over the ground level and the other two-three floors; there are also three large basement floors under the building crops and courtyard which have a place for around 360 parking-places. The bearing construction of the building is made of reinforced concrete. Building façade is made from brick. The building is supplied by district heating and is cooled by chilled ventilation air (mechanical ventilation) and cooling baffles in the rooms. The lighting system is equipped with fluorescent low energy lamps. The ventilation plant is provide with heat recovery.

Technical Data

Building use	**Office**
Area	**34.359 m²**
PEC before or reference value	**157,00 kWh/m²y**
PEC	**110,70 kWh/m²y**
Energy savings %	**29,4 %**
Absolute savings	**1.590.822,00 kWh/y**
Financial info	/

Partner: Fastighetsaktiebolaget Storbådan

Building: Storbådan 5

GreenBuilding 2013

Project : Refurbishment

Address: Hemsögatan 14-16, 211 24 - Malmö

Country: Sweden

Building Description and Technical Measures

This project concerns a refurbishment of a building constructed between 1970-1979. It has a concrete structure, in 2009 old obsolete windows has been changed with three pane glazed ones. The ventilation system consists of a supply and exhaust unit equipped with heat exchanger. Old air handling units have been replaced by new energy efficient ones. The heating system is water-based and heat is supplied by district heating and ventilation. Hot water circulation system is provided of several heat exchangers: one for radiators, one for ventilation and one for domestic hot water use. In 2012 a new control system has been put in place with the function of regulating water temperature.

Technical Data

Building use	**Logistics & Storage**
Area	**13.021 m²**
PEC before or reference value	**104,07 kWh/m²y**
PEC	**73,40 kWh/m²y**
Energy savings %	**29,4 %**
Absolute savings	**398.429,00 kWh/y**
Financial info	/

Partner: Fastighetsbolaget Brödtorget & Co AB

Building: Dragarbrunn 24:5

GreenBuilding : 2013

Project: Refurbishment

Address: Dragarbrunnsgatan 42-44, 753 22 - Uppsala

Country : Sweden

Building Description and Technical Measures

Dragarbrunn 24:5 is an office building located in Dragarbrunnsgatan 42-44 in Uppsala, Sweden. It was constructed in 1974 and the total area is 16.858 m^2. The assemply is supplied by district heating from Vattenfall Värme Uppsala and a cooling machine. The ventilation system has been upgraded with high efficiency heat recovery units. After renovation, the measured energy end use decreased with approximately 36.9%. During the last years, LED lights have been installed in the building.

Technical Data

Building use	**Office**
Area	**16.858 m²**
PEC before or reference value	**146,69 kWh/m²y**
PEC	**92,5 kWh/m²y**
Energy savings %	**36,9 %**
Absolute savings	**913.535,00 kWh/y**
Financial info	**/**

Partner: Finnboda Industrilokaler HB

Building: Marketenteriet

GreenBuilding : 2013

Project: Refurbishment

Address: Finnbodavarsväg 9, 131 73 - Nacka

Country : Sweden

Building Description and Technical Measures

From 1942 until 1980 the building was used as office and canteen space for the people who worked at the Finnoboda shipyard. In 2012 the building has been completely restored for office use with high efficiency equipment. New windows and doors have been put in place. Additional insulation has been placed on the roof and all the envelope insulation has been improved. The new ventilation system has been equipped with heat recovery; radiators have been equipped with thermo-static valves.

Technical Data

Building use	**Office**
Area	**2.324 m²**
PEC before or reference value	**208,00 kWh/m²y**
PEC	**149,00 kWh/m²y**
Energy savings %	**34,1 %**
Absolute savings	**137.116,00 kWh/y**
Financial info	/

Partner: Folksam

Building: Pilen 30

GreenBuilding 2013

Project: Refurbishment

Address: Vasagatan 36, 106 60 - Stockholm

Country: Sweden

Building Description and Technical Measures

Pilen 30 is a combined office (34%) and hotel (66%) building in central Stockholm. It was built in 1980 and refurbished in 2011. It has eight floors and one basement floor. The building is supplied by district heating and district cooling and is equipped with a ventilation heat exchanger.

Technical Data

Building use	**Hotel & Accommodation**
Area	**7.067 m²**
PEC before or reference value	**295,00 kWh/m²y**
PEC	**192,00 kWh/m²y**
Energy savings %	**35 %**
Absolute savings	**73.000,00 kWh/y**
Financial info	/

Partner: Folksam

Building: Raseborg 3

GreenBuilding : 2013

Project: Refurbishment

Address: Malaxgatan 7, 164 74 - Kista

Country : Sweden

Building Description and Technical Measures

The building Roseborg is composed of 3.364 m^2 for offices spaces and 1.127 m^2 for storage. It was built in 1986 and is located in Kista, outside of Stockholm. The construction is heated through district heating and ventilated with four separated ventilation system. This system is equipped with heat recovery (80% efficiency). The server room is cooled by district cooling. A new control system has been installed in 2009 which helped very much the energy saving strategy.

Technical Data

Building use	**Office**
Area	**4.491 m²**
PEC before or reference value	**170,20 kWh/m²y**
PEC	**114,80 kWh/m²y**
Energy savings %	**25,7 %**
Absolute savings	**248.802,00 kWh/y**
Financial info	/

Partner: Förde Sparkasse

Building: Förde Sparkasse Riegelbau

GreenBuilding : 2013

Project: Refurbishment

Address: Lorentzendamm 28-30, 24103 - Kiel

Country : Germany

Building Description and Technical Measures

This existing building consists of 6 storeys. It was built in 1970- 1979. Its heated net floor area amounts to 7.820 m^2. Only the load bearing has been kept: skeleton and concrete slab. It is supplied with district heating. Cooling is produced by a centralized mechanical plant and is shaded by surrounding objects. Sanitary hot water is produce with electric boiler. The average U value of the construction is 0,49 $W/m^2/K$.

Technical Data

Building use	**Office**
Area	**7.810 m²**
PEC before or reference value	**170,90 kWh/m²y**
PEC	**106,90 kWh/m²y**
Energy savings %	**37,40 %**
Absolute savings	**499.413,00 kWh/y**
Financial info	**/**

Partner: Frank Seuling

Building: Energiepark Hirschaid

GreenBuilding : 2013

Project: Refurbishment

Address: Leimhüll 8, 96114 - Hirschaid

Country : Germany

Building Description and Technical Measures

The project aim is the conversion of an industrial facility belonging to the plastics-processing sector into an office, conference and exhibition centre. The factory was built between 1970 and 1979. The plan is to develop, during two construction phases, the former factory building, with a floor area of 4.000 m^2, into an energy park. The silo-tank which has been used for plastic-granulates storage, will be converted into a conference room. In addition to the structural changes, the concept also provides the building with innovative renewable technologies. This includes, among other systems, a 214 m^2 large photovoltaic façade, combined heat and power system and small turbine units. The building will be also equipped with a groundwater heat pump and with a biomass heating system. Regarding the envelope, the insulation has been improved and triple glazed unit have been installed. The objective is to cover almost 100% of on-site power required for the system installed in the building. It is also planned to provide close to 100% of the needed heat by using renewable energy. In order to evaluate consumptions and to calculate values possible to compare with, a mathematical building model has been created.

Technical Data

Building use	**Office**
Area	**2.700 m²**
PEC before or reference value	**406,00 kWh/m²y**
PEC	**149,00 kWh/m²y**
Energy savings %	**64 %**
Absolute savings	**690.045,00 kWh/y**
Financial info	**/**

Partner: FS Immobilien Koblenz GmbH & Co. KG

Building: FS128 – Diestleistungszentrum

GreenBuilding : 2013

Project: New Building

Address: Ferdinand-Sauerbruch-Straße 26, 56073 - Koblenz

Country : Germany

Building Description and Technical Measures

This five-story building hosts offices spaces with a basement garage. The envelope is very well insulated, especially the windows which are equipped with triple glass and shading devices.. A ground source heat pump provides the whole building with low temperature water. This heat pump takes its energy from a 590 m^2 underground water basin which gets frozen to ice in controlled way. The ice gets melted frequently with solar and environmental energy absorbed by a (passive) collector located on the roof of the building. At the end of the heating period the ice is not melting anymore and the huge block is used for passive cooling during the summer. The ventilation system is equipped with heat recovery. The workplaces are lightened by individual standards lamps which are automatically controlled and dimmed by presence and daylight.

Technical Data

Building use	**Office**
Area	**4.559 m²**
PEC before or reference value	**169,81 kWh/m²y**
PEC	**112,71 kWh/m²y**
Energy savings %	**36,20 %**
Absolute savings	**260.308,00 kWh/y**
Financial info	**€ 426.000,00**

Partner: Galären i Luleå AB

Building: Ödlan 10

GreenBuilding 2013

Project : New Building

Address: Ödlegatan 6, 971 28 - Luleå

Country: Sweden

Building Description and Technical Measures

This The building is a new construction for retail use with office, retail and storage spaces. There are high internal gains as a result from waste heat recovery from the refrigeration. Furthermore, the building is designed with low heating losses due to low U-values and high efficiency of the heating recovery.

Technical Data

Building use	**Wholesale & Retail**
Area	**1.474 m²**
PEC before or reference value	**140,00 kWh/m²y**
PEC	**75,00 kWh/m²y**
Energy savings %	**46,40 %**
Absolute savings	**95.810,00 kWh/y**
Financial info	/

Partner: Galären i Luleå AB

Building: Räven 20

GreenBuilding : 2013

Project: Refurbishment

Address: Skeppsbrogatan/Storgatan, 971 28 Luleå

Country : Sweden

Building Description and Technical Measures

This project concerns the refurbishment of an office building located in Luleå. The building is connected to a district heating system and has a water heating system with convectors/radiators. In order to achieve the energy saving requested the following measures have been adopted: all air handling units have been replaced with new ones, except those who serve the hotel; a new district heating sub-station with pressured controlled pumps and a new regulation system has been provided; new windows have been installed on the ground floor and also new generation elevator have been installed.

Technical Data

Building use	**Office**
Area	**7.865 m²**
PEC before or reference value	**252,10 kWh/m²y**
PEC	**178,30 kWh/m²y**
Energy savings %	**29,2 %**
Absolute savings	**580.437,00 kWh/y**
Financial info	**/**

Partner: Gävlefastigheter AB

Building: Gävle Teater Norrtull 28:2

GreenBuilding 2013

Project : Refurbishment

Address: Teaterplan 1, 803 23 - Gävle

Country: Sweden

Building Description and Technical Measures

Gävle Theatre was built between the years 1876 - 1878 after the old theatre was destroyed in the great fire of 1869. In this ancient building, built in 1870, many energy saving measures have been implemented, regarding especially ventilation. The building has a surface of 6.200 m^2. It is a heavy construction with underwork, floor structure and walls made out of stone. Heating is supplied by district heating .The building is heated by 7 different heating groups. The building is ventilated by ten air handling units out of which five has thermal wheel and five has recirculated air regulated by occupancy and/or CO2-sensors.

The following measures have been adopted in order to reduce consumptions:

A total of seven circulation pumps was replaced by new pressure controlled pumps; balancing of air flow for two air handling units; a total number of 16 fans in air handling units or exhaust fans was replaced with new energy efficient direct-drive motors to enable pressure control and to reduce maintenance of the systems; two air handling systems has been equipped with dampers to enable regulation of air flow to different zones based on building occupancy; variable frequency drives was installed for seven large air handling units.

Technical Data

Building use	**Cultural**
Area	**6.200 m²**
PEC before or reference value	**201,00 kWh/m²y**
PEC	**127,50 kWh/m²y**
Energy savings %	**36,6 %**
Absolute savings	**456.940,00 kWh/y**
Financial info	/

Partner: Gävlefastigheter AB

Building: Hedesunda Centralskola

GreenBuilding 2013

Project: Refurbishment

Address: Skolvägen 5, 810 40 - Hedesunda

Country: Sweden

Building Description and Technical Measures

Hedesunda School outside Gävle is an elementary school with approximately 170 pupils. The school contains classrooms, kitchen, canteen, gymnasium and library. The energy saving measures were focused mainly on heating and ventilation system. All the radiators thermostats were changed to prevent overheating and zone dampers were installed in order to turn off the different zones depending on operation load. The rest of measures, except for water savings measures, mainly regarded the ability to control and regulate the different technical systems in the buildings and also optimization and trimming of the operating hours.

Technical Data

Building use	**Education**
Area	**3626 m²**
PEC before or reference value	**226,50 kWh/m²y**
PEC	**161,60 kWh/m²y**
Energy savings %	**28,7 %**
Absolute savings	**235.328,00 kWh/y**
Financial info	/

Partner: Gävlefastigheter AB

Building: Sjömanskyrkan Norr 2:2

GreenBuilding 2013

Project: Refurbishment

Address: Stora Esplanadgatan 1, 803 11 - Gävle

Country: Sweden

Building Description and Technical Measures

Sjömanskyrkan is an ancient church built in 1890-91, it was originally built for visiting mariners and had a great importance for the Christian, cultural and social community of Gävle. Today it is mainly used for programs and courses for dance and music activities. The renovation started in 2010. A new BMS (Building Management System) has been installed in order to regulate the heating system not only in relation to outside temperature. Old thermostats vales have been substituted and the ventilation system efficiency improved. The lighting system has been equipped with fluorescent lamps with presence sensor control.

Technical Data

Building use	**Sport & Leisure**
Area	**2.407 m²**
PEC before or reference value	**141,40 kWh/m²y**
PEC	**103,70 kWh/m²y**
Energy savings %	**26,7 %**
Absolute savings	**90.743,90 kWh/y**
Financial info	/

Partner: Gävlefastigheter AB

Building: Skogsmursskon Sörby

GreenBuilding 2013

Project: Refurbishment

Address: Kungsbäcksvägen 54, 802 67 - Gävle

Country: Sweden

Building Description and Technical Measures

Skogsmursskon Sörby is a school with approximately 250 pupils. The building was used as an industrial premise until was refurbished and dedicated to educational porpoise. The building includes offices, classrooms and workshop for training. The energy saving measures regarded mainly the heating and ventilation system: optimization of operating hours, substitution of the obsolete valves with new generation ones, installation of new circulation pumps and fan units, installation of zone dampers, water saving measures, new efficient lighting, improvement of insulation and sealing of windows frames.

Technical Data

Building use	**Education**
Area	**5.220 m²**
PEC before or reference value	**163,90 kWh/m²y**
PEC	**119,30 kWh/m²y**
Energy savings %	**27,2 %**
Absolute savings	**232.812,00 kWh/y**
Financial info	/

Partner: Generali Lebensversicherung AG

Building: Theresienhöhe Süd

GreenBuilding : 2012

Project: New Building

Address: Theresienhöhe 30, 80636 - München

Country : Germany

Building Description and Technical Measures

This new building adopted many technical measures with the final goal of energy saving: free cooling, district heating, ventilation heat recovery, heating system with out-door temperature regulation, activation of night drawdown and week-end drawdown.

The lighting system is equipped with luminaries with light direction, painted reflectors, electronic ballasts.

All energy data consumption are recorded and monitored. Windows are equipped with clear double glazed unit and movable shading devices.

Technical Data

Building use	**Office**
Area	**13.169 m²**
PEC before or reference value	**230,00 kWh/m²y**
PEC	**167,00 kWh/m²y**
Energy savings %	**27,39 %**
Absolute savings	**829.672,00 kWh/y**
Financial info	/

Partner: GHELAMCO POLAND Sp.z o.o.

Building: Marynarska 12

GreenBuilding : 2013

Project: New Building

Address: Marynarska 12, 02-674 - Warszawa

Country : Poland

Building Description and Technical Measures

This modern business park office offers 40.000 m2 of office space designed with care for the maximum comfort of the future tenants. Excellent location enables access to public transport. Marynarska 12 consists of 8 above ground stories and 3 levels of underground parking. The ground floor is designated for retail areas and offices. The envelope of the building has been designed to minimise the use of energy for heating and cooling. U values for walls amounts to 0,22 W/m^{2}K and 0,15 W/m^{2}K for the roof. The windows are double glazed with a low solar energy transmittance coefficient (g = 0.3).Air conditioning is not allowed with windows open. Heat loss in the building entrance zone is reduced by installing air curtains and revolving doors. Offices are equipped with energy-efficient lamps. The toilet lighting is based on LED technology. Also lighting motion sensors were installed. A rotary heat exchanger has been installed in the air handling units that enables high efficient heat and humidity recovery. Chilled water pumps are equipped with inverters which adapt their operation to the refrigerant demand of building. The building is equipped with a BMS (Building Management System) to improve the quality and efficiency of the building usage and to help optimize energy and water consumption.

Technical Data

Building use	**Office**
Area	**48.775 m²**
PEC before or reference value	**310,60 kWh/m²y**
PEC	**212,30 kWh/m²y**
Energy savings %	**31,6 %**
Absolute savings	**4.794.583,00 kWh/y**
Financial info	**/**

Partner: Gnilde AB

Building: Likriktaren 3

GreenBuilding : 2013

Project: New Building

Address: Mikrofonvägen 28, 12581 - Hägersten

Country : Sweden

Building Description and Technical Measures

This project concerns the renovation of the office building Likriktaren 3. Supporting structure and exterior walls consists of precast frame with steel; large parts of the facades are made of glass except some parts containing concrete blocks with insulation in between. The main measures which have been taken regard the heat recovery system on the air handling units; the system has been rebuilt to increase energy efficiency. New system solution does not allow any more heating and cooling system to operate at the same time. Free-cooling have been installed on the refrigerant-bearing system which able outdoor air during wintertime.

Technical Data

Building use	**Office**
Area	**5.500 m²**
PEC before or reference value	**268,70 kWh/m²y**
PEC	**140,80 kWh/m²y**
Energy savings %	**47,5 %**
Absolute savings	**- kWh/y**
Financial info	**/**

Partner: GOLBECK Public Partner GmbH

Building: Behördenzentrum Heppenheim

GreenBuilding : 2013

Project: New Building

Address: Ummelner Str. 4-6, 33649 - Bielefeld

Country : Germany

Building Description and Technical Measures

Built in 2012, this office building offers working places for about 300 employees. The building has been certified as passive-house by the Passivhausinsitut in Darmstadt. The project is realised as a Public/Private Partnership (PPP). Golbeck is responsible for the facility management for a period of 30 years; this includes energy management and the obligation to run the building to guarantee the amount of energy requested.

Windows are equipped with triple glazed unit and have no thermal breaks. All thermal bridges has been localised and eliminated. The average U value for the envelope amounts to 0,36 W/m^2/K. The construction is equipped with a heat pump for heating production with outdoor-temperature regulation. The ventilation system is provided with heat recovery system with very high efficiency (91%). The building adopted external shading devices with automatic control to avoid unwanted solar gains. Lighting system has a daylight responsive control. All energy data consumption are recorded.

Technical Data

Building use	**Office**
Area	**10.127 m²**
PEC before or reference value	**145,60 kWh/m²y**
PEC	**65,10 kWh/m²y**
Energy savings %	**55,2 %**
Absolute savings	**814.986,00 kWh/y**
Financial info	**/**

Partner: Hang Xing Machinery Manufacturing Company

Building: Hang Xing Technology Center

GreenBuilding : 2013

Project: New Building

Address: He Ping Li East Str. Dongcheng District NO.11, 100013 - Bei Jing

Country : China

Building Description and Technical Measures

This office building located in Bei Jing has a surface of 33.500 m^2. It is supplied by district heating. Ventilation system is provided with an air handling system with heat recovery. To reach 26 C^0 in summer time, cooling machines are used when the natural ventilation capacity is not enough to cool down the building. The lighting system is based on fluorescent lamps (T5). Several energy-efficient control systems are installed as: day-light responsive control, time scheduling control, occupancy linking control and sound control in corridor and stairs.

Technical Data

Building use	**Office**
Area	**33.554 m²**
PEC before or reference value	**130,00 kWh/m²y**
PEC	**96,00 kWh/m²y**
Energy savings %	**26,15 %**
Absolute savings	**1.140.836,00 kWh/y**
Financial info	**/**

Partner: Härryda Terminalen

Building: Landevetter 3:286

GreenBuilding 2013

Project : New Building

Address: c/o Fastighetschef Bockasjö AB, Box 1258, 501 12 - Borås

Country: Sweden

Building Description and Technical Measures

The activities hosted in this building are primarily warehouse and offices. The construction consists in a steel frame, concrete floors and sandwich-wall with rock wool insulation. The construction is connected to Landevetter airport district heating network. Heating and ventilation are controlled by a web-based control system. Ventilation, in the stock hall, is also regulated by temperature and carbon dioxide sensors. Staff facilities as changing rooms and toilets are equipped with presence detection for lighting system. All personnel working in the building have a high awareness of energy issues. The staff shall work with a long-term thinking in the choice of energy sources, operation & maintenance.

Technical Data

Building use	**Logistics & Storage**
Area	**31.550 m²**
PEC before or reference value	**100,0 kWh/m²y**
PEC	**63,00 kWh/m²y**
Energy savings %	**37 %**
Absolute savings	**1.167.350,00 kWh/y**
Financial info	/

Partner: Hemsö Fastighets AB

Building: Byrådirektören 4

GreenBuilding 2013

Project: Refurbishment

Address: von Troils väg 2-8, Malmö

Country: Sweden

Building Description and Technical Measures

This project concerns the refurbishment of building which hosts a school. The structure is made of reinforced concrete and masonry. It is supplied by district heating and equipped with heating pump and heat recovery system. Efficient lighting system has been installed because for safeness reasons most of the lights are turn on all day. Technical plants are equipped with meters to monitor and control data consumption.

Technical Data

Building use	**Education**
Area	**5.471 m²**
PEC before or reference value	**190,00 kWh/m²y**
PEC	**133,00 kWh/m²y**
Energy savings %	**30 %**
Absolute savings	**311.847,00 kWh/y**
Financial info	/

HUBERT HAUPT
IMMOBILIEN HOLDING

Partner: Hubert Haupt Immobilien Holding

Building: NuOffice

GreenBuilding : 2013

Project: New Building

Address: Luise-Ulrich-Str.2, 82031 Grünwald

Country : Gemany

AWARD GREENBUILDING 2014

Building Description and Technical Measures

The "NuOffice" is built in Schwabing in north Munich. It is an office building, the six-storey Main building is adjacent to the north Domagkstraße. The two five-story wings facing to the south are connected by a bridge located on the second floor. The bridge spans between the wings second-storey entrance area. The building is fully built and includes a 2 - storey underground garage with 82 parking spaces. The building is very well insulated, its U average value amounts to 0.3 W/m^2/K. It is supplied by district heating. For cooling strategy a ground source heat pump is adopted. Windows are equipped with external shading devices to avoid unwanted solar gains. The ventilation system is provided with heat recovery. The building is also equipped with a photovoltaic plant (790 m^2 absorbing area) and with a combined Heat and Power (CHP) system.

Technical Data

Building use	**Office**
Area	**10.067 m²**
PEC before or reference value	**152,50 kWh/m²y**
PEC	**23,30 kWh/m²y**
Energy savings %	**85 %**
Absolute savings	**1.300.656,40 kWh/y**
Financial info	/

HUFVUDSTADEN

Partner: Hufvustaden AB

Building: Nordstaden 8:24, Köpmannavaruhuset Femman

GreenBuilding : 2013

Project: Refurbishment

Address: Kyrkogatan 54, 411 08 - Göteborg

Country : Sweden

Building Description and Technical Measures

This project concerns the refurbishment of an existing office building constructed in 1972. The following measures have been taken with the goal of energy saving: replacement of the old air handling units with new ones equipped with a heat recovery system and energy efficient fans; reduction of the pressure drops in duct system; replacement of the supply air diffusers and lowering of the supply air temperature; installation of energy efficient lighting system in the stores; substitution of the old elevators with more efficient ones; customizing the airflow for the different stores.

Technical Data

Building use	**Office**
Area	**52.740 m²**
PEC before or reference value	**161,50 kWh/m²y**
PEC	**108,80 kWh/m²y**
Energy savings %	**32,6 %**
Absolute savings	**2.779.398,00 kWh/y**
Financial info	/

Partner: Humlegården Fastigheter AB

Building: Cirkunsängen 6 (Swedbank HQ)

GreenBuilding : 2013

Project: New Building

Address: Landsvägen, Sundbyberg

Country : Sweden

Building Description and Technical Measures

The new Swedbank head quarter office will be located in this building. The building is constructed with a steel frame, precast concrete elements and a curtain wall façade with window's shadings. In the basement are located technical rooms, garages and sport halls. The first and second floors host a foyer, a restaurant, a meeting room, an auditorium and a wellness centres. The remaining seven floors are open offices spaces for 2.500 persons. The building is supplied by district heating and equipped with a tri-cogeneration plant. For the cooling strategy a geothermal system is used. The ventilation system is provide heat recovery (90% efficiency).

Technical Data

Building use	**Office**
Area	**39.771 m²**
PEC before or reference value	**100,00 kWh/m²y**
PEC	**45,00 kWh/m²y**
Energy savings %	**55 %**
Absolute savings	**2.187.405,00 kWh/y**
Financial info	**/**

Partner: Humlegården Fastigheter AB

Building: Ugnen 7

GreenBuilding : 2013

Project: Refurbishment

Address: Industrivägen 1, 17148 - Solna

Country : Sweden

Building Description and Technical Measures

This existing building is located just outside the city limit of Stockholm, in Solna. Was built in 1986 and renovated in 2011-2012. The building has 7 floors: 2 underground and 5 above ground. It mainly hosts offices (floors 3-7) a restaurant is located at 3rd floor and a garage at 2nd floor. There are also maintenance and warehouse at 1st and 2nd floor. The renovation included the placement of a HVAC system with integrated evaporative cooling, which replaced also the previous cooling machine. This system uses tap water for cooling. The ventilation system is equipped with heat recovery (92% efficiency). Triple glazed unit have been replaced to old windows in order to achieve better U-value of the envelope.

Technical Data

Building use	**Office**
Area	**5.213 m²**
PEC before or reference value	**393,50 kWh/m²y**
PEC	**142,80 kWh/m²y**
Energy savings %	**63,7 %**
Absolute savings	**1.307.101,00 kWh/y**
Financial info	/

Partner: Husvärden AB

Building: Kängurun 18

GreenBuilding : 2013

Project: New Building

Address: Krookslätts Fabriker 52, 43137 - Mölndal

Country : Sweden

Building Description and Technical Measures

Kängurun 18 is a new office building located in Mölndal, Sweden. A high energy efficiency focus has been kept throughout the entire design and construction stage. The construction has a very good insulation and very low transmittance value for all components of the envelope. Ventilation is fully on demand (VAV) and is provided with high heat recovery efficiency (80%). The building is supplied with district heating and equipped with a photovoltaic plant. For cooling strategy the windows are equipped with effective external sunscreens. Free cooling is combined with a heat pump system to cover any needs. The lighting system is provided with occupancy linking control.

Technical Data

Building use	**Office**
Area	**4.117 m²**
PEC before or reference value	**100,00 kWh/m²y**
PEC	**46,00 kWh/m²y**
Energy savings %	**54 %**
Absolute savings	**228.493,00 kWh/y**
Financial info	**/**

Partner: IFK Växjö Arena AB

Building: Telekonsult Arena

GreenBuilding 2013

Project: Refurbishment

Address: Systratorpsvägen 16, Box 3007, 350 33 - Växjö

Country: Sweden

Building Description and Technical Measures

IFK Växjö Arena AB is one of the leading athletic associations in Sweden for children, youth and athletics. This project is a new construction for an athletic arena. Its surface amounts to 7.400 m^2, including office spaces, dressing room and the arena itself. The construction is made of concrete slab. The exterior walls consist partly of concrete sandwich up to 3 meters and the rest consists of insulated sandwich panels. The building is provided with a VAV system for heating and ventilation, which is equipped with heat recovery. The source of heat is district heating. The distribution system for heating is water and air-borne.

Technical Data

Building use	**Sport & Leisure**
Area	**7.400 m^2**
PEC before or reference value	**203,00 kWh/m^2y**
PEC	**53,00 kWh/m^2y**
Energy savings %	**75,00 %**
Absolute savings	**1.110.000,00 kWh/y**
Financial info	/

Partner: Ikano Kontor

Building: Ideon Gateway

GreenBuilding 2013

Project: New Building

Address: Scheelevägen 27, 223 70 - Lund

Country: Sweden

Building Description and Technical Measures

Ideon gateway is located in Lund, at the Ideon Science Park. It is a twenty floor building constructed with concrete beams and columns reinforced with steel. It will host different services: hotel, restaurant, offices, retail spaces, fitness centre and others.

The exteriors walls are mostly curtain walls with glass sections. Windows and walls are very well insulated and achieved very low U-values. The building is ventilated by a supply system equipped with high efficient heat recovery (80% of efficiency). The ventilation system is controlled by presence detectors and temperature sensors. A geothermal system provides the building for heating and cooling. Part of the electricity requested comes from a PV plant.

Technical Data

Building use	**Hotel & Accommodation**
Area	**22.536 m²**
PEC before or reference value	**44,00 kWh/m²y**
PEC	**25,70 kWh/m²y**
Energy savings %	**44 %**
Absolute savings	**412.409,00 kWh/y**
Financial info	/

Partner: Ikano Retail

Building: Kungens Kurva

GreenBuilding 2013

Project : New Building

Address: Modulvägen, 141 75 - Huddinge

Country: Sweden

Building Description and Technical Measures

The project comprises the construction of a shopping centre. It has 3 floors above ground with an open parking at the bottom. The building is supplied with district heating and district cooling. The most of the used cooling will come from the sorption cooling system in the air handling units that serves the walkways, shops and office spaces. The envelope average U-value is 0,66 W/m^2/K. VAV is installed in the shops. Constant flow ventilation is installed for the pantry, storage, WC and cleaning. The ventilation plant is provided with heat recovery (78% of efficiency). Lighting is controlled by light sensors, detectors and time channels, LED lights are used extensively. All electric materials is free from halogen substances. All electricity that is used in the building is produced from windmills. The building is equipped with a computerized system and will have a web interface.

Technical Data

Building use	**Wholesale & Retail**
Area	**29.143 m²**
PEC before or reference value	**100,00 kWh/m²y**
PEC	**55,00 kWh/m²y**
Energy savings %	**45 %**
Absolute savings	**1.311.435,00 kWh/y**
Financial info	/

Partner: Ikano Retail

Building: Ikano Handelsplats Norra Backa byggnad 1

GreenBuilding 2013

Project : New Building

Address: Norra Backagatan 3A-3E, 781 70 - Borlänge

Country: Sweden

Building Description and Technical Measures

This commercial building hosts retail stores and offices. Its heating system is equipped with an electric heat pump. The cooling system is equipped with a ground source heat pump. The cooling strategy is also helped by external shading devices placed on the transparent elements. The ventilation system is provided with heat recovery (80% of efficiency). A very performing insulation system of the envelope enable the building to achieve a very good average U value of 0,22 W/m^{2}K.

Technical Data

Building use	**Wholesale & Retail**
Area	**13.297 m²**
PEC before or reference value	**75,00 kWh/m²y**
PEC	**33,00 kWh/m²y**
Energy savings %	**56 %**
Absolute savings	**558.474,00 kWh/y**
Financial info	/

Partner: Ikano Retail Centres Kuopio Oy

Building: Matkus Shopping center, Kuopio, Finland

GreenBuilding 2013

Project : New Building

Address: Matkuksentie 60, 70800 - Kuopio

Country: Finland

Building Description and Technical Measures

Sustainability is a key asset for Ikano Retail Centres. Life cycles of the building and energy issues have been taken into account in the design, construction and equipment selection. Ikano Matkus is a family friendly shopping centre hosting IKEA, 90 stores, restaurants and cafés. Glass, open areas and many daylight inlets make it welcoming and pleasant.

Energy simulation has been carried out for the proposed building to prove required saving. Energy savings in heating energy consumption are achieved by using regenerative heat recovery which has a very high efficiency of 80% for heat exchange. For this equipment the reimbursement time is less than one year, meaning that the system is highly beneficial regarding cost-efficiency. District heating is produced in 35% by wind power. Water ti be used in the building is measured with a main water meters. All consumptions are comprehensive monitored. Air conditioning machine utilise the energy contained in the exhaust ait to warm up fresh air. The air conditioning machines have room condition specific controls, such as CO2 and temperatures controls. Controlling the lighting in the trade corridors is affected by daylight. Water cooling machines are not used for cooling when outdoor temperature is below 15^0 Celsius.

Technical Data

Building use	**Wholesale & Retail**
Area	**50.560 m²**
PEC before or reference value	**240,00 kWh/m²y**
PEC	**175,00 kWh/m²y**
Energy savings %	**27 %**
Absolute savings	**3.286.400,00 kWh/y**
Financial info	/

Partner: Institute of Science and Technology (IST) Austria

Building: Lab Building East

GreenBuilding 2012

Project: New Building

Address: Am Campus 1, 3400 - Klosterneuburg

Country: Austria

Building Description and Technical Measures

The Lab Building East, part of the Institute of Science and Technology (IST) Austria, is located on the Campus Klosterneuburg in Maria Gugging. This building including laboratories, offices and seminar rooms is used for basic research in natural sciences and for educational purposes. It is built in massive construction with ventilated facades and triple glazing resulting in a passive house quality of the building envelope. Biomass district heating is mainly used to heat the building in winter, geothermal energy for cooling in summer. The heat pump is also used for cooling in summer, if free cooling does not provide sufficient power. For peak load situations due to laboratory purposes cooling energy is supplied by additional cooling plants. Electricity is generated by photovoltaic modules (62.58 kWpeak). Flexible shading elements and inclination of the facade ensure a minimum of unintentional solar gain. Additionally the photovoltaic modules are used as shading elements to avoid summer overheating.

Technical Data

Building use	**Education**
Area	**6040 m²**
PEC before or reference value	**39,02 kWh/m²y**
PEC	**13,98 kWh/m²y**
Energy savings %	**64,16 %**
Absolute savings	**151.226,00 kWh/y**
Financial info	**€ 1.130.000,00**

Partner: J.H.S Prague, a.s.

Building: Jindřišská 16

GreenBuilding : 2013

Project: Refurbishment

Address: Jindřišská 16, 110 00 - Prague

Country : Czech Republic

Building Description and Technical Measures

The existing old building consists of only two main street wings; the refurbishment has been designed to meet criteria for class A building. The average value for the new part amounts to 0,3 W/m^2/K. For the heating system condensing boilers have been installed in order to decrease operational costs and increase efficiency; high performance pumps are used for primary and secondary loop. High efficiency thermal insulation is used for hot water piping. The ventilation system is equipped with heat recovery. Air handling units will be controlled with timed programmes based on the requirements for use of the services rooms. Two compressor-cooling units cooled by mixture of water and propylene glycol provide the chilled water production. Free-cooling is used during colder months. For artificial lighting new generation fluorescent lamps have been adopted. Office lighting will be controlled by illumination intensity values. Rooms are equipped with daylight responsive control and presence control.

Technical Data

Building use	**Office**
Area	**8.388 m²**
PEC before or reference value	**179,00 kWh/m²y**
PEC	**122,50 kWh/m²y**
Energy savings %	**31,5 %**
Absolute savings	**473.238,00 kWh/y**
Financial info	**/**

Partner: Jungmannova Estates a.s.

Building: Jungmannova 15

GreenBuilding : 2013

Project: Refurbishment

Address: Jungmannova 15, 110 00 - Prague

Country : Czech Republic

Building Description and Technical Measures

The project is based on the preservation of the building facade designed in original Art Noveau style. The rest of the building is completely restored following design criteria for class A. Preserved old building and new courtyard construction form one single complex. The building will host mostly offices, but also café and shops. For heating the building is equipped with gas/ condensation boilers which utilize Low Nox technology. The main sources of energy saving by heating will be represented by the use of waste low-potential heat from cooling technology. Chilled water meters have been installed on the cooling system and are connected to the central control system. The offices will be pre-cooled with cool night air. Another source of cost saving will be the equi-thermal control of hot water for heating in relation to the indoor air temperature. Rainwater is collected and used in order to reduce sanitary water consumption. The air handling units are equipped with heating and cooling exchangers as well as system for heat recovery (70%), including humidity recovery. Exterior lighting will be controlled by daylight sensors. Offices lighting will be controlled by illumination intensity sensors.

Technical Data

Building use	**Office**
Area	**10.312 m²**
PEC before or reference value	**179,00 kWh/m²y**
PEC	**111,40 kWh/m²y**
Energy savings %	**37,7 %**
Absolute savings	**696.977,00 kWh/y**
Financial info	/

Partner: Kaiserwasser Bau-und Errichtungs GmbH und Co

Building: UniCredit Center Am Kaiserwasser

GreenBuilding: 2013

Project: New Building

Address: Althanstraße 21-25, 1090 - Wien

Country: Austria

Building Description and Technical Measures

This building will host private training and education facilities; it will also function as a sport and leisure facility for staff and could be used also for events. Employees can expect state-of-the-art learning and development facilities. Kaiserwasser is a beautiful and well-known recreation area in Wien. With its architecture this centre reflects a new learning approach and culture: the area for team's learning is located on the first and second floor and consists of six learning labs of varying size and a learning forum, covering a total area of 780m^2. Each unit is equipped with advanced media and presentation technologies. An out-door area – learning garden – is also available. Room temperature, lighting, speakers, flat screen monitors, etc. can be individually controlled in all rooms by iPads attached to wall brackets. The building is very well insulated achieving a very good average U value of 0,27 W/m^{2}K. It is equipped with well dimensioned geothermal heat pumps for heating and cooling. Free cooling is integrated into the chiller. The ventilation system is provided with heat recovery. Lighting system is provided with daylight responsive control.

Technical Data

Building use	**Sport & Leisure**
Area	**8.980 m²**
PEC before or reference value	**/ kWh/m²y**
PEC	**64,05 kWh/m²y**
Energy savings %	**63,9 %**
Absolute savings	**/ kWh/y**
Financial info	**€ 320.000,00**

Partner: Katholische Kirchengemeinde St. Joseph

Building: Neubau Kindergarten St. Luitgard

GreenBuilding 2013

Project: New Building

Address: Rudolf-Wild-Str. 40, 69214 - Eppelheim

Country: Germany

Building Description and Technical Measures

This building has been newly erected in 2013 and will be used as a kindergarten. The building is well insulated and is provided with heat mirrors double glazed with thermal break. Well dimensioned heating pumps with power regulation have been installed for the heating plant; outdoor-temperature regulation have improved the system functioning. The ventilation plant is provided with heat recovery (75% efficiency). The lighting system is provided with efficient fluorescent lamps with electronic ballasts. Occupancy linking control have been introduced.

Technical Data

Building use	**Education**
Area	**1.676 m²**
PEC before or reference value	**196,60 kWh/m²y**
PEC	**134,80 kWh/m²y**
Energy savings %	**31,4 %**
Absolute savings	**103.610,00 kWh/y**
Financial info	**€ 206.100,00**

KLÖVERN

Partner: Klövern AB

Building: Diket 10

GreenBuilding : 2013

Project: Refurbishment

Address: Drottninggatan 66, 602 32 - Norrköping

Country : Sweden

Building Description and Technical Measures

Diket 10 is a property built in 1968 on a concrete frame structure with clinker facade, and is located on Drottingatan 66/Nygatan 93 in Norrkoping. The establishment consists of five floors of 6012 m2 and it used for office and small shops. Heating is provided by district heating. In 2012 there were several measures operating efficiency, resulting in energy saving of over 42%. The following measures have been implemented with the refurbishment: new circulation pumps, heat pump installation, control and regulation system, and new exhaust ventilation units.

Technical Data

Building use	**Office**
Area	**6.012 m²**
PEC before or reference value	**284,90 kWh/m²y**
PEC	**164,10 kWh/m²y**
Energy savings %	**42 %**
Absolute savings	**120,8 kWh/m²y**
Financial info	/

KLÖVERN

Partner: Klövern AB

Building: Druvan 13

GreenBuilding : 2012

Project: Refurbishment

Address: Tingvallag. 17, 652 25 - Karlstad

Country : Sweden

Building Description and Technical Measures

The application relates to a building on Tingvalla Road 17 in Karlstad. The building's frame is made of concrete and built in 1947 with four storeys over basement and ground floor. The area is 5330 square meters. Since 2008 a variety of energy saving measures have been made. These measures have been made to increase energy savings, which result just under 29%. The savings consist of replacement of control systems, ventilation systems, windows, thermostats and lift to optimize operations and installation of presence-controlled lighting.

Technical Data

Building use	**Office**
Area	**5.530 m²**
PEC before or reference value	**99,90 kWh/m²y**
PEC	**71,00 kWh/m²y**
Energy savings %	**28,93 %**
Absolute savings	**kWh/y**
Financial info	/

KLÖVERN

Partner: Klövern AB

Building: Flygfyren 3

GreenBuilding : 2012

Project: New Building

Address: Luise-Ulrich-Str.2, 82031 Grünwald

Country : Gemany

Building Description and Technical Measures

This application relates to property Flygfyren based in Malmö, designated as a local property with exclusive office space and an area of 6.000 m^2. Large amounts of energy were consumed in 2009 and 2010 and measures have been taken to stop this trend. This application is aimed at reducing the energy consumption by at least 25% according to GreenBuilding criteria for an existing building, the consumption for the year 2010 is 185.5 kWh/m^2y and after the actions to reduce the consumptions 124 kwh/m^2y . The property has had major problems with room control and has even had both cooling and heating active in the office space during a period of time. The chiller is an older model and not taking advantage of free cooling to the extent possible. And fan motors will be replaced with energy-saving EC motors.

Technical Data

Building use	**Office**
Area	**5.147 m²**
PEC before or reference value	**185,70 kWh/m²y**
PEC	**124,00 kWh/m²y**
Energy savings %	**33,23 %**
Absolute savings	**317.569,90 kWh/y**
Financial info	/

KLÖVERN

Partner: Klövern AB

Building: Grävlingen 5

GreenBuilding : 2012

Project: Refurbishment

Address: Skaraborgsvägen 21 - 21A, Borås

Country : Sweden

Building Description and Technical Measures

The application relates to a building on Skaraborg Road 21 in Boras. The building structure consists of concrete and was constructed in 1887. The last rebuild was in 1990. The building consists of six floors plus the attic. The area is 8662 square meters. Since 2008, several energy conservation measures were implemented, which together resulted in a saving of almost 28 percent. The savings are adding an eco-software for control and regulation system, replacement of outdoor lighting products, new transistors for electric panels, the introduction of command-controlled cooling of the premises and operating efficiency.

Technical Data

Building use	**Office**
Area	**8.662 m²**
PEC before or reference value	**99,20 kWh/m²y**
PEC	**71,50 kWh/m²y**
Energy savings %	**27,92 %**
Absolute savings	**kWh/y**
Financial info	**/**

KLÖVERN

Partner: Klövern AB

Building: Linjalen 60, Täby

GreenBuilding : 2013

Project: Refurbishment

Address: Nyckelvägen 14, Nyköping

Country : Sweden

Building Description and Technical Measures

This project concerns a refurbishment of building located on Måttbandsvägen 12 1 in Täby. It was built in 1991 with a concrete structure. It has 3 floors and its surface amounts to 4.156 m^2. During 2011 the ventilation system has been completely renovated. The new system is equipped with control and regulation system and frequency controlled fans. The activities of refurbishment gave a saving of more than 45%.

Technical Data

Building use	**Office**
Area	**4.156 m²**
PEC before or reference value	**92,90 kWh/m²y**
PEC	**176,50 kWh/m²y**
Energy savings %	**47,3 %**
Absolute savings	**347.442,00 kWh/y**
Financial info	**/**

KLÖVERN

Partner: Klövern AB

Building: Svänghjulet 1

GreenBuilding : 2012

Project: Refurbishment

Address: Enhagsslingan 1, Täby

Country : Sweden

Building Description and Technical Measures

The application relates to a building on Enhagsslingan 1 in Täby. It is about a building made of concrete in 1990 with three floors and 5.354 m^2. During 2010-2011 a total ventilation rebuilding was done. The savings is about exchange of control and regulation and regulation system, gate mounted on the channels, trimming of ventilation, etc. The energy efficiency measures taken have enable to save more than 43% of energy consumption; from 136,70 kWh/m^2 to 77,20 kWh/m^2.

Technical Data

Building use	**Office**
Area	**5.354 m²**
PEC before or reference value	**136,70 kWh/m²y**
PEC	**77,20 kWh/m²y**
Energy savings %	**43,54 %**
Absolute savings	**318.563,00 kWh/y**
Financial info	/

KLÖVERN

Partner: Klövern AB

Building: Ugglum 9:242

GreenBuilding 2013

Project : New Building

Address: Industrivägen 59, Partille

Country: Sweden

Building Description and Technical Measures

This project concerns a new post office located in Partille, Sweden. The building is a steel frame construction with sandwich elements. Very good insulation has been achieved as the average U value amounts to 0,2 W/m^{2}K. The heating system is equipped with an air - water heat pump while the cooling is provided through an outdoor condensing unit. The ventilation system is a VAV/CAV system with regenerating heat exchanger. The VAV parts are controlled by CO2 and temperature sensors.

Technical Data

Building use	**Wholesale & Retail**
Area	**2.086 m²**
PEC before or reference value	**55,00 kWh/m²y**
PEC	**40,00 kWh/m²y**
Energy savings %	**27,2 %**
Absolute savings	**31.290,00 kWh/y**
Financial info	/

Partner: Kreissparkasse Heinsberg

Building: KSK Heinsberg

GreenBuilding : 2013

Project: New Building

Address: Dr.-Eberle-Platz 1, 41812 - Erkelenz

Country : Germany

Building Description and Technical Measures

This new office building is located in Erkelenz. It has been planned to be a sustainable and energy efficiency building. A high reduction of carbon dioxide will be reached by a combination of optimized construction methods and innovative technical plant. For cooling strategy mobile external shading with automatic control has been installed. The cooling production system is based on a ground source heat pump. The ventilation system is equipped with heat recovery (60% of efficiency). A good insulation of the envelope enable the building to achieve an average U value of 0,45 W/ m^2/K. Construction and refurbishment procedures adopted by this Partner include the use of regional materials as the use of natural stone of regional origin. The lighting system is equipped with daylight responsive controls and occupancy linking controls.

Technical Data

Building use	**Office**
Area	**7.898 m²**
PEC before or reference value	**151,09 kWh/m²y**
PEC	**105,82 kWh/m²y**
Energy savings %	**30 %**
Absolute savings	**357.554,00 kWh/y**
Financial info	**/**

Kreissparkasse Mayen
www.kskmayen.de

Partner: Kreissparkasse Mayen

Building: annex building of the Kreissparkasse Mayen

GreenBuilding : 2013

Project: New Building

Address: St.-Veit-Straße 22-24, Mayen

Country : Germany

AWARD GREENBUILDING 2014

Building Description and Technical Measures

This project concerns an office building for retail bank, financial consulting and credit department. The building envelope has a very good insulation which enable to achieve a U average value of 0,4 W/m^2/K. The building is supplied by district heating and is equipped with well dimensioned heating pumps with power regulation while the cooling ventilation is carried out through a centralized mechanical cooling plant and well sized external shading. The ventilation plant is provided with heat recovery (75% efficiency). The building is also equipped with a photovoltaic plant. Fluorescent lamps have replaced old inefficient ones and LCD monitors have replaced CRT ones. Presence control system is active. All energy consumption data are recorded. The company has its own team for environmental policies and actions.

Technical Data

Building use	**Office**
Area	**3.710 m²**
PEC before or reference value	**118,06 kWh/m²y**
PEC	**40,80 kWh/m²y**
Energy savings %	**65,4 %**
Absolute savings	**286.394,00 kWh/y**
Financial info	**€ 1.632.582,00**

Partner: Kristianstad Kotofen Handelsfastighet AB

Building: Kofoten 3

GreenBuilding 2013

Project : New Building

Address: Jochums väg 5, 29159 - Kristianstad

Country: Sweden

Building Description and Technical Measures

Kofoten 3 is a retail building belonging to Granngården, a chain specialized in livestock and gardening. It has two floors; the ground floor hosts retail spaces and storage areas. The second floor is dedicated to the staff. The building is heated through district heating. Cooling is supplied to the greatest possible extent with the free cooling ventilation. At high outdoor temperature, a fluid cooler placed on the roof-top is used. Ventilation works on variable airflow. A VAV system is placed in the retail areas with CO2-controlled fresh air intake. The lighting system is equipped with highly efficient lighting with T5 fluorescent lamps with high frequency drives-absence and time controlled.

Technical Data

Building use	**Wholesale & Retail**
Area	**1.730 m²**
PEC before or reference value	**116,00 kWh/m²y**
PEC	**77,00 kWh/m²y**
Energy savings %	**33,6 %**
Absolute savings	**62.280,00 kWh/y**
Financial info	/

Partner: Kulturarena Fastighets AB

Building: Bryggaren 2

GreenBuilding 2013

Project: New Building

Address: Lillågatan 1, 44130 - Alingsås

Country: Sweden

Building Description and Technical Measures

The project concerns a handball arena located in Alingsås. It a new building made of concrete. It has been constructed with energy efficiency goals. Its average U value amounts to 0,43 W/m^{2}K (opaque and transparent surface) Its total area amounts to 4.870 m^2. The building is equipped with heat recovery (80% efficiency).

Technical Data

Building use	**Sport & Leisure**
Area	**4.870 m²**
PEC before or reference value	**110,00 kWh/m²y**
PEC	**82,00 kWh/m²y**
Energy savings %	**25,4 %**
Absolute savings	**184.000,00 kWh/y**
Financial info	/

Partner: Kungsleden

Building: Kv Plattan 4

GreenBuilding 2013

Project: Refurbishment

Address: Isolatorvägen 5, Kristianstad

Country: Sweden

Building Description and Technical Measures

This building has been constructed in 1991. It's surface amounts to1.328 m2 and is constructed with steal pillars while the façade is made of metal sheets. Before the re-furbishment was oil heated, now substituted by a groundwater heat pump for both heating and cooling.

Technical Data

Building use	**Manufacturing & Industry**
Area	**1.328 m²**
PEC before or reference value	**86,20 kWh/m²y**
PEC	**32,30 kWh/m²y**
Energy savings %	**65,5 %**
Absolute savings	**71.578,60 kWh/y**
Financial info	/

Partner: Landschaftverband Westfalen-Lippe (LWL)

Building: Museum für Naturkunde

GreenBuilding 2012

Project : Refurbishment

Address: Sentruper Str. 285, 48161 - Münster

Country: Germany

Building Description and Technical Measures

The existing museum building (natural history) is an cultural institution of the Landschaftsverband Westfalen-Lippe (LWL). The main aspects of the energy concept are the reduction of energy demand, the environmentally friendly production of energy and the efficient energy use. The building was constructed between 1980 –1989. The refurbishment took place in 2010. A fist step was the improvement of the thermal insulation of the envelope. Obsolete windows have been replaced or equipped with low transmittance glass. A new ventilation system has been put in place with integrated humidification and heat recovery. The heating production system consists in a biomass boiler. As internal power supplier a CHP system has also been installed.

Technical Data

Building use	**Cultural**
Area	**9.269 m²**
PEC before or reference value	**109,66 kWh/m²y**
PEC	**314,83 kWh/m²y**
Energy savings %	**65,2 %**
Absolute savings	**1.901.700,00 kWh/y**
Financial info	/

Partner: Lantmännen Agconfas AB

Building: Danmarks-Säby 9:1

GreenBuilding 2012

Project: New building

Address: Sollentuna

Country: Sweden

Building Description and Technical Measures

The acclimated area in Danmarks-Säby is 4.017 m^2. The building is supplied with heat from a ground heat pump, free cooling from the boreholes is used. The ventilation system is equipped with heat recovery system; the air supply is cooled and heated. The rooms are heated with radiators and some rooms are cooled with room units.

Measured energy consumption is divided on facility and tenant by calculating. The total facility energy use is measured/calculated to 52 kWh/m^2. The government requirement is 123 kWh/m^2.

Technical Data

Building use	**Office**
Area	**4.017 m²**
PEC before or reference value	**123,00 kWh/m²y**
PEC	**52,00 kWh/m²y**
Energy savings %	**57,72 %**
Absolute savings	**kWh/y**
Financial info	/

Partner: Luleheden II AB

Building: Storheden 1:100 hus 1

GreenBuilding 2013

Project : New Building

Address: Luleå

Country: Sweden

Building Description and Technical Measures

This building develops on two floors for a total heated area of 6.510 m^2. Its structure is made of concrete and steel pillars. The envelope is very well insulated and all thermal bridges eliminated. The ventilation is equipped with a variable volume control system and a heat recovery system (80% efficiency). Also a CO2 detector is installed on the system to help the air fresh input control. The building is supplied by district heating for heat and hot water.

Technical Data

Building use	**Wholesale & Retail**
Area	**6.510 m²**
PEC before or reference value	**193,00 kWh/m²y**
PEC	**130,90 kWh/m²y**
Energy savings %	**32,2 %**
Absolute savings	**410.130,00 kWh/y**
Financial info	/

Partner: Luleheden II AB

Building: Storheden 1:100 hus 2

GreenBuilding 2013

Project : New Building

Address: Luleå

Country: Sweden

Building Description and Technical Measures

This retail building is located in Luleå Kommun. Its envelope (floors, roof, and plinths) is very well insulated and construction elements well sealed. The building is supplied by district heating. Cooling is supplied to the greatest possible extent with free cooling by ventilation. At high temperature, fluid coolers placed on rooftop is used. The ventilation system is equipped with heat recovery through effective speed-controlled non – hygroscopic rotating heat-exchanger with 80& thermal efficiency. The VAV system in retail areas has CO2-controlled fresh air intake. The lighting system is equipped with highly efficiency T5 fluorescents lamps with high frequency drives-absence and time controlled. The building is equipped with a computerized control system with WEB-connected monitoring.

Technical Data

Building use	**Wholesale & Retail**
Area	**5.300 m²**
PEC before or reference value	**145,00 kWh/m²y**
PEC	**119,40 kWh/m²y**
Energy savings %	**38,10 %**
Absolute savings	**137.800,00 kWh/y**
Financial info	/

Partner: Marc Asbeck Grundebesitz Bonn (MAG)

Building: Park Office II

GreenBuilding 2013

Project: New building

Address: Heinrich - Brüning Str. 5, 53113 Bonn

Country: Germany

Building Description and Technical Measures

This office building consists of seven floors above ground and three underground. From the first floor to the third, the façade is glazed all around. Windows with hidden inner frames were selected. The external walls between the third and the sixth floor are insulated with an external insulation composite system. The flat floor is arranged in levels of terraces. The heating is provided by groundwater heat pumps. For the peak load district heating is supplied. The ventilation plant is equipped with a heat recovery system. For cooling strategy a water-water heat pump is use. In the lighting system fluorescent lamps with aluminium reflectors have been adopted. Occupancy linking controls have been introduced.

Technical Data

Building use	**Office**
Area	**12.545 m²**
PEC before or reference value	**223,90 kWh/m²y**
PEC	**144,36 kWh/m²y**
Energy savings %	**35,5 %**
Absolute savings	**997.854,00 kWh/y**
Financial info	**€ 691.000,00**

Partner: Max Hamburgerrestauranger AB

Building: Kv. Strömbrytaren 8

GreenBuilding 2012

Project: New Building

Address: Ulvsundavägen 160, Bromma

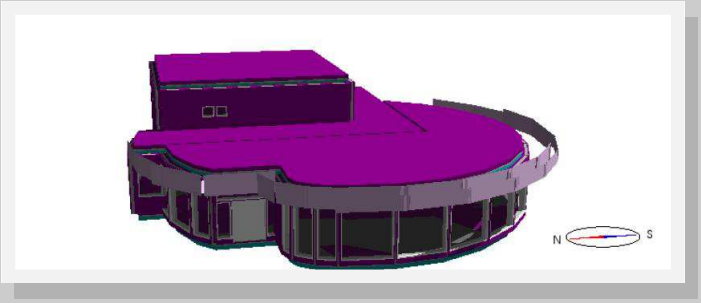
Country: Sweden

Building Description and Technical Measures

MAX Hamburger restaurant in Bromma has been operational since the opening date of 27 May 2010. The construction work was started in November 2009 and finished in May 2010. Basic layout is a ground floor with restaurant area, toilet facilities, kitchen, a dish-washing room, refrigeration rooms and goods reception. The 2nd floor is containing staff room, office and mechanical rooms. The building's mainly consisting of prefabricated construction units. The vertical framework has sandwich walls and steel pillars, and the wall insulation varies between 134 and 150 mm. Windows will have double insulating glass units with warm edge and Argon gas filling. U-value including frame is calculated to 1,4 W/m², K. Permanent shading on the ground floor is provided by vertical panels of polycarbonate, located on consoles about 1 m from the façade. Heating system is district heating with radiators and heating coil in AHU. Cooling system is electric water chiller with VAV airbourne cooling. Two compressor chillers will serve the refrigeration rooms. Efficient light sources (including LEDs) will be used, 20-100% daylight control and presence detection in rooms that are not used permanently. On the roof of the restaurant, 80 m2 of PV-cells with battery bank is installed supplying electricity to the building. Max Hamburgerrestauranger AB has en energy policy with key focus on sustainability. The work strategies and organisation structure is clearly outlined and delegates responsibilities such as; energy- and media mapping, identify staff education, monthly analyses of energy and compare with the targets, develop new operational strategies and suggest more energy saving actions based on the analyses.

Technical Data

Building use	**Restaurant & Catering**
Area	**460 m²**
PEC before or reference value	**146,00 kWh/m²y**
PEC	**63,90 kWh/m²y**
Energy savings %	**56,23 %**
Absolute savings	**37.766,00 kWh/y**
Financial info	/



Partner: McDonald's Franchise GmbH

Building: McDonald's SCS Vösendorf

GreenBuilding 2013

Project: New Building

Address: Shopping City Süd Parkplatz, 2334 - Vösendorf

Country: Austria

Building Description and Technical Measures

A new McDonalds store was constructed above existing basement in November 2011. The construction was built in wood frame construction, including the utilization of thermal insulation exceeding the local building regulations. Furthermore a gas boiler with solar thermal was installed for heating and hot water production; in addition a PV-system has been installed on the roof.

Technical Data

Building use	**Restaurant & Catering**
Area	**408 m²**
PEC before or reference value	**516,00 kWh/m²y**
PEC	**372,00 kWh/m²y**
Energy savings %	**27,9 %**
Absolute savings	**58.713,00 kWh/y**
Financial info	**€ 33.100,00**

Partner: McDonald's Nederland BV

Building: McDonald's Amsterdam ZO

GreenBuilding 2012

Project: Refurbishment

Address: Muntbergweg 16-18, - 1101 ED Amsterdam

Country: Netherlands

Building Description and Technical Measures

The restaurant was renovated in 2011. Many measures have been taken in order to reduce energy consumption. The old boiler has been substituted and an electric pump installed. Also for the centralized mechanical cooling plant an air-air heat pump has been provided. The building is also equipped with a solar thermal plant, a wind generation system (2.5 kW) and a photovoltaic plant (56 m^2 absorbing area). The ventilation system is provided with heat recovery. This project will works as a pilot project for other interventions in Mc Donald's restaurants.

Technical Data

Building use	**Restaurant & Catering**
Area	**409 m²**
PEC before or reference value	**947,39 kWh/m²y**
PEC	**428,04 kWh/m²y**
Energy savings %	**54,8 %**
Absolute savings	**212.571,00 kWh/y**
Financial info	**79.300 euro**

Partner: Mondelez Österreich GmbH

Building: Mondelez Österreich GmbH, Jacobsgasse 3

GreenBuilding : 2013

Project: Refurbishment

Address: Jacobsgasse 3, A-1140 Vienna

Country : Austria

Building Description and Technical Measures

This office building, built in 1967, has been refurbished to provide new comfortable working places for 150 persons. Its gross floor area amounts to 2.395 m^2 and is distributed on two floors. The overall concept to improve the thermal insulation of the envelope (for walls, roof, etc.) gave as a result, a high reduction of heating and cooling demand. Old windows have been replaced by new ones with double pane and low-e glazing. To avoid unwanted solar gains in summer, external shading devices have been installed. The obsolete lighting system has been up-graded with LED technology. The heating/cooling system has been equipped with an air-water heat pump. The new ventilation system is provided with heat recovery (65% of efficiency) and is part of the overall energy-efficiency- strategy. Ecological sustainability and environmental measures are one of the four main pillars of the sustainability policy of Kraft Foods.

Technical Data

Building use	**Office**
Area	**2.395 m²**
PEC before or reference value	**295,04 kWh/m²y**
PEC	**127,71kWh/m²y**
Energy savings %	**56,7 %**
Absolute savings	**402.192,4 kWh/y**
Financial info	**172.000 Euro**

Partner: NCC Property Development AB

Building: Kaninen 32

GreenBuilding 2013

Project: New building

Address: Rådmansgatan 16, 21146 - Malmö

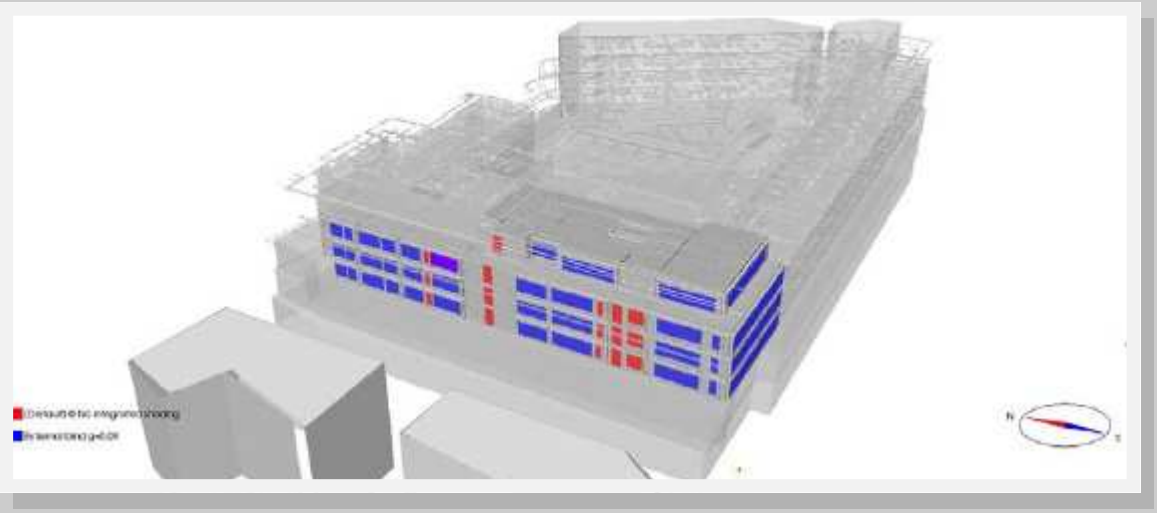
Country: Sweden

Building Description and Technical Measures

This building is located in Malmö and hosts the offices of a newspaper. It has 4 floors above ground and shares a parking garage below ground level. The building has a metal structure with an envelope composed of insulation and bricks. The building contains a constant air volume ventilation system, equipped with heat recovery. The heat is produced by district heating and distributed by radiators. Cooling is produced by a central cooling unit and distributed through the ventilation and local cooling units. To improve the indoor climate and reduce the need of cooling, external solar shading have been placed on the south and west façade, as well as solar control glass.

Technical Data

Building use	**Office**
Area	**5.587 m²**
PEC before or reference value	**124,00 kWh/m²y**
PEC	**52,00 kWh/m²y**
Energy savings %	**58 %**
Absolute savings	**402.264,00 kWh/y**
Financial info	/



Partner: NCC Property Development AB

Building: Stapelbädden

GreenBuilding 2013

Project: New building

Address: Vallgatan 3, 170 67 - Solna

Country: Sweden

Building Description and Technical Measures

This project concerns a new building hosting offices and retails spaces. The building has 6 floors above ground and a small basement; its heated area amounts to 8.964 m^2. It has a concrete structure and the envelope is made of insulated sandwich elements. Central heating is equipped with VAV system ventilation and heat recovery. The heat is produced by high efficient heat pumps and is distributed by radiators. Cooling is distributed through the ventilation system and is produced by the same heat pumps used for the heating system. To improve the indoor climate and reduce the need of cooling, south and west side windows are equipped with external shading devices as well as control glass.

Technical Data

Building use	**Office**
Area	**8.964 m²**
PEC before or reference value	**60,00 kWh/m²y**
PEC	**35,00 kWh/m²y**
Energy savings %	**41,6 %**
Absolute savings	**224.100,00 kWh/y**
Financial info	/

Partner: NCC Property Development AS

Building: Tangen – Domicil til ATEA

GreenBuilding 2013

Project: New building

Address: Tangen 4, 8200 - Aarhus

Country: Denmark

Building Description and Technical Measures

This new office building has three floors and a basement. It has a very good envelope performing insulation, average U value amounts to 0,28 W/m^2/K. It is supplied by district heating while cooling is provided by a centralized mechanical cooling plant equipped with air-water heat pump. The ventilation system is equipped with heat recovery (84% efficiency).

Technical Data

Building use	**Office**
Area	**7.977 m²**
PEC before or reference value	**77,30 kWh/m²y**
PEC	**56,00 kWh/m²y**
Energy savings %	**27,5 %**
Absolute savings	**169.910,00 kWh/y**
Financial info	/

Partner: NCC Property Development Oy

Building: Falcon Business Park, Office Building Falcon

GreenBuilding 2013

Project: New building

Address: Vaisalantie 2–8, 02130 - Espoo

Country: Finland

Building Description and Technical Measures

Falcon Business Park is located in Otaniemi, in the Helsinki metropolitan region. Falcon Business Park consists of four buildings that are constructed in stages. An assessment of the life cycle costs has been made for all the buildings. The energy consumption was taken into account from the early design stages. Two examples of the energy saving idea are the implementation of lighting with occupancy linking control for each working place and the implementation of solution to improve air tightness. Measured value for air tightness in Office Building falcon Gentti in heated spaces is n50 = 0,5 1/h. Finnish standard value for it amounts to n50 = 2,0 1/h (according building standard in force in 2010). The windows used have a U-value of 1,0 W/m2/K. By improving the heat recovery units the yearly energy efficiency was enhanced from 45%, which is the standard set by Finnish regulation, in 2010, to 72,6.

Technical Data

Building use	**Office**
Area	**11.791 m²**
PEC before or reference value	**145,00 kWh/m²y**
PEC	**87,10 kWh/m²y**
Energy savings %	**39,9 %**
Absolute savings	**682.699,00 kWh/y**
Financial info	/

Partner: NCC Property Development Oy

Building: Plaza III Business Park – Office Building Plaza III

GreenBuilding 2013

Project: New building

Address: Äyritie 16-24, 01510 - Vantaa

Country: Finland

Building Description and Technical Measures

Plaza III Business Park is centrally located at Åyritie, Vantaa, in the Helsinki metropolitan region close to the main airport. Plaza III Business Park consists of five buildings that are constructed in stages. The whole Park while be finished in 2013. An assessment of the life cycle costs has been made for all the buildings. The energy consumption was taken into account from the early design stages. Two examples of the energy saving idea are the implementation of lighting with occupancy linking control for each working place and the implementation of solution to improve air tightness. Measured value for air tightness in Office Building Plaza III Hehku in heated spaces is n50 = 0,4 1/h. Finnish standard value for it amounts to n50 = 2,0 1/h (according building standard in force in 2010). By improving the heat recovery units the yearly energy efficiency was enhanced from 45%, which is the standard set by Finnish regulation, in 2010, to 70,6.

Technical Data

Building use	**Office**
Area	**8.277 m²**
PEC before or reference value	**171,10 kWh/m²y**
PEC	**117,60 kWh/m²y**
Energy savings %	**31,2 %**
Absolute savings	**447.785,00 kWh/y**
Financial info	/

Partner: Netto Marken-Discount AG & Co. KG

Building: Netto Ellrich

GreenBuilding 2013

Project : New Building

Address: Industriepark Ponholz 1, 93142 - Maxhütte-Haidhof

Country: Germany

Building Description and Technical Measures

This building is used by the supermarket company Netto. It is generally used 16 hours a day for 310 days per year. The space hosts a sales floor, a bakery, a stock area and a personnel room. It is constructed with massive walls and thermal insulation. The average U value amounts to 1,2 W/m²/K). The main sale area is covered with a monopitch roof with thermal insulation covered with EPDM layer. The entrance, the bakery and the personnel room is covered by a flat floor. The largest part of the heat is produced by an electric pump with a heat recovery system which uses the wasted heat coming from the cooling system for the fridges and the freezers of the sale floor. To reach the targeted temperature of 20°, calorific value boiler is installed. Additionally, a fresh air system allows changing the whole air by three till four times per hour. The lighting system is equipped with fluorescent lamps with aluminium reflectors. Multi-function devices replaced separate single -function devices.

Technical Data

Building use	**Wholesale & Retail**
Area	**1.128 m²**
PEC before or reference value	**157,20 kWh/m²y**
PEC	**117,15 kWh/m²y**
Energy savings %	**29,3 %**
Absolute savings	**45.180,00 kWh/y**
Financial info	/

Partner: Netto Marken-Discount AG & Co. KG

Building: Netto Halle-Diemitz

GreenBuilding 2013

Project : New Building

Address: Birkhahnweg 100, 06116 - Halle-Diemnitz

Country: Germany

Building Description and Technical Measures

This retail building, used by supermarket company Netto, is used 16 hours a day and 310 days per year. It is divided in sales floor, stock and personnel rooms. It is built with massive walls with thermal insulation. The main area is covered with a monopitch roof with thermal insulation. The entrance area, the bakery and the personnel rooms are covered by a flat roof. The most of the heat is produced by an electric heat pump provided with a heat recovery system which uses the waste heat of the cooling system for the fridges and freezers on the sales floor. To reach the target temperature of 21 ^{0} C a gas boiler is used. For the lighting system fluorescent lamps have been chosen.

Technical Data

Building use	**Wholesale & Retail**
Area	**1.045 m²**
PEC before or reference value	**145,20 kWh/m²y**
PEC	**112,00 kWh/m²y**
Energy savings %	**27,6 %**
Absolute savings	**34.698,00 kWh/y**
Financial info	/

Partner: Netto Marken-Discount AG & Co. KG

Building: Netto Herzebrock

GreenBuilding 2013

Project : New Building

Address: Beelener Straße 32, 33442 Herzebrock-Clarholz

Country: Germany

Building Description and Technical Measures

This Netto Supermarket has a heated net volume of 3.237 m3 and is used 16 hours a day for 310 days per year. The building has separated areas for sales, bakery and personnel; its envelope consists in massive walls with high performance thermal insulation. A monopitch roof covers the main area of the construction. Most of the heat used is produced by an electric heat pump with heat recovery system. This system uses the waste heat of the cooling system for the fridges and the freezers of the sales rooms. To reach the targeted temperature of 20^0C a condensing boiler is installed. The bakery area is equipped also with a cooling system. The lighting system is provided with high efficiency fluorescent lamps; aluminium reflectors have replaced painted ones. The temperature of the hot water for the boiler has been reduced.

Technical Data

Building use	**Wholesale & Retail**
Area	**1.044 m²**
PEC before or reference value	**142,90 kWh/m²y**
PEC	**103,40 kWh/m²y**
Energy savings %	**27 %**
Absolute savings	**41.268,00 kWh/y**
Financial info	/

Partner: Netto Marken-Discount AG & Co. KG

Building: Netto Halle-Holzminden

GreenBuilding 2013

Project : New Building

Address: Papiermühle 7, 37603 Holzminden

Country: Germany

Building Description and Technical Measures

This Netto Supermarket has a heated net volume of 4.099 m^3 and is used 16 hours a day for 310 days per year. The building has separated areas for sales, bakery and personnel; its envelope consists in massive walls with high performance thermal insulation. A monopitch roof covers the main area of the construction. Most of the heat used is produced by an electric heat pump with heat recovery system. This system uses the waste heat of the cooling system for the fridges and the freezers of the sales rooms. To reach the targeted temperature of 20^0C a condensing boiler is installed. The bakery area is equipped also with a cooling system. The lighting system is provided with high efficiency fluorescent lamps; aluminium reflectors have replaced painted ones. The temperature of the hot water for the boiler has been reduced.

Technical Data

Building use	**Wholesale & Retail**
Area	**1.048 m²**
PEC before or reference value	**143,03 kWh/m²y**
PEC	**106,40 kWh/m²y**
Energy savings %	**25,6 %**
Absolute savings	**41.960,00 kWh/y**
Financial info	/

Partner: Netto Marken-Discount AG & Co. KG

Building: Netto Schmidmühlen

GreenBuilding 2013

Project : New Building

Address: Bahnhohstraße 6, 92287 - Schmidmühlen

Country: Germany

Building Description and Technical Measures

This supermarket building has a net floor area of 1.056 m^2. It used 13 hours a day and 310 days per year. It has different areas: sales, bakery, stock and personal room. The envelope consists in massive walls with thermal insulation (U value:0,4 $W/m^2/K$). The main area is covered with a monopitch roof with thermal insulation. The average value of the envelop amounts to 1,09 $W/m^2/K$.

The main part of the heat is produced by an electric heat pump with heat recovery which uses the waste heat of the cooling system for the ridges and freezers on the sales floor. To reach the target temperature of 20 ^0C, a calorific value boiler is installed. Regulation system on the secondary supply system has been improved. Temperature of hot water boiler has been reduced.

The lighting system is equipped with fluorescent lamps replacing incandescent lamps and aluminium reflectors have substituted white painted ones. For the electric equipment the following measures have been adopted: multi-function devices have replaced separate single-function devices; LCD monitors have been chosen instead of CRT ones.

Technical Data

Building use	**Wholesale & Retail**
Area	**1.056 m²**
PEC before or reference value	**154,07 kWh/m²y**
PEC	**105,55 kWh/m²y**
Energy savings %	**31,5 %**
Absolute savings	**51.241,00 kWh/y**
Financial info	/

Partner: "Neue Heimat" Gemeinnützige hnungs- und Siedlungsgesellschaft Ges.m.b.H.

Building: Hernalser 3

GreenBuilding 2013

Project: New building

Address: Hernalser Gürtel 1– 1170 Wien

Country : Austria

Building Description and Technical Measures

This new office building is situated at Hernalser Gürtel 1, in the 17th municipal district of Vienna. It has 4 below-ground levels, containing storage rooms and a garage for 54 cars, and 13 floors above-ground. The 9th-11th floors are reserved for residential use. The offices are situated on the ground floor and from the 1st to 8th floor, covering an area of 5.397 m^2.The supporting system of the construction is a reinforced concrete frame construction.

The façade is a combination of closed surfaces, clad with anodized perforated aluminium sheet and box-type windows. The envelope U-value amounts to 0, 52 $W/m^2/K$.

The heating and hot-water system is provided by district heating, backed by a heat pump system in connection with concrete core thermal activation of the slotted walls. Energy saving measured have been installed on the heating system as: outdoor temperature regulation, activation of night-drawdown and week-end drawdown. Cooling energy is supplied by a cold water aggregate in combination with a glycol cooler and by using a reverse geothermal system (vertical closed loop field). The cooling is delivered by the ventilation system, by concrete core activation of the floor slabs and by additional fan coil units.

Technical Data

Building use	**Office**
Area	**5.397 m²**
PEC before or reference value	**263,80 kWh/m²y**
PEC	**100,25 kWh/m²y**
Energy savings %	**62 %**
Absolute savings	**882.679,35 kWh/y**
Financial info	**€ 367.000**

Partner: Niam AB

Building: Nora 11

GreenBuilding 2012

Project: Refurbishment

Address: Drottninggatan 16, 21149 - Malmö

Country : Sweden

Building Description and Technical Measures

The property Nora 11, Malmö, with an area of approx. 35 000 sqm, was constructed in 1980 and is an office building with garage in the basement.

From 2010 to the beginning of 2011, the building's ventilation and the heat pumps were changed to a system with much higher efficiency. All fans were also connected to the heat exchanger system. New accumulators are connected to both sides of the cold and heat pumps system. This means that more energy can be saved. The air from the warm garage is lead through a heat exchanger to be regained. All fans are completed with frequence regulations.

On a monthly basis the energy consumption is being measured and followed up by the technical manager. All information is kept in one database for all properties. The information is quarterly reported and analyzed in order to make improvements. Yearly, in accordance with the budget process, savings and action plans for relevant properties are done for the coming year (s).

Technical Data

Building use	**Office**
Area	**34.845 m²**
PEC before or reference value	**94,10 kWh/m²y**
PEC	**58,80 kWh/m²y**
Energy savings %	**37,51 %**
Absolute savings	**1.230.030,00 kWh/y**
Financial info	/

Partner: Norrporten i Örebro AB

Building: Kv Lantmäteriet 2

GreenBuilding 2013

Project: Refurbishment

Address: Järnvägsgatan 3, 703 61 - Örebro

Country : Sweden

Building Description and Technical Measures

This building is partially used as office for the police and partially as custody. The construction is an 8 floors government building. The structural part consists in concrete and steel and the façade is made of facing plaster, bricks and wooden walls. The building has been equipped with a high performing heating pump with geothermal storage for heating and cooling. The ventilation plant is provided with heat recovery. All measured data is recorded in the Building Management System where real time readings are possible.

Technical Data

Building use	**Office**
Area	**14.425 m²**
PEC before or reference value	**121,40 kWh/m²y**
PEC	**60,10 kWh/m²y**
Energy savings %	**50,5 %**
Absolute savings	**871.992,50 kWh/y**
Financial info	/

Partner: Norrporten i Örebro AB

Building: Kv Porten Rättscentrum Örebro

GreenBuilding 2013

Project: New building

Address: Klostergatan 37, 703 61 - Örebro

Country : Sweden

Building Description and Technical Measures

Building "Rättscentrum" is located in Örebro. It is an office building of 16,683 square meters. The construction consists of steel and concrete. It has one floor underground and ten floors above ground. The heating and cooling systems are equipped with a geothermal heating pump. The average U-value amounts to 0,27 W/m2/K thanks to very good insulation of walls and ceilings. The ventilation system is provided with heat recovery (75%).

Technical Data

Building use	**Office**
Area	**16.683 m²**
PEC before or reference value	**55,00 kWh/m²y**
PEC	**29,7 kWh/m²y**
Energy savings %	**46 %**
Absolute savings	**422.080,00 kWh/y**
Financial info	**/**

Partner: ÖBAU Mössler Baustoffhandel GmbH

Building: ÖBAU Mössler - Landskron

GreenBuilding 2012

Project : New Building

Address: Hauptschulstrasse 1, 9523 - Landskron

Country: Austria

Building Description and Technical Measures

ÖBAU Mössler, the biggest builder's merchant in Carinthia, enlarges its location in Landskron – Hauptschulstraße 1 with a new and modern sales building. The existing DIY market on site is deconstructed to a cold storage warehouse.

It already started with the first planning steps for the DIY market that besides economic, functional and aesthetic requirements a high value was set on the energy efficiency of the building. The energy demand could be minimised by optimal heat insulation and sun protection measures.

In order to cover the low remaining energy demand an efficient system technology is applied. Thus, groundwater heat pump, heat recovery in ventilation plants as well as Free Cooling through groundwater and night ventilation is used.

Technical Data

Building use	**Wholesale & Retail**
Area	**8.719 m²**
PEC before or reference value	**75,25 kWh/m²y**
PEC	**32,14 kWh/m²y**
Energy savings %	**57,28 %**
Absolute savings	**375.830,00 kWh/y**
Financial info	/

Partner: OBI GmbH & Co. Deutschland KG

Building: OBI Hamburg Bergedorf

GreenBuilding 2013

Project : New Building

Address: Kurt-A.-Körber Chaussee, 21033 - Hamburg

Country: Germany

Building Description and Technical Measures

This new market in Hamburg Bergedorf features a new system with regard to the store ventilation and heating. The ventilation has been equipped by heat recovery with very high efficiency and new motors with EC-technology. The store heating is provided by decentralised unit heaters with very low power consumption in combination with a modern control system. A new generation gas-heat pump covers a corresponding part of heat requirement. A second heat pump is used for heating tap water. The building shell is insulated above average. Windows are equipped with clear double glazed unit. All thermal bridges have been localised and eliminated. The whole lighting system was changed to a modern one with T5 lamps and daylight response control. All consumption data are registered.

Technical Data

Building use	**Wholesale & Retail**
Area	**8.840 m²**
PEC before or reference value	**188,06 kWh/m²y**
PEC	**120,64 kWh/m²y**
Energy savings %	**35,8 %**
Absolute savings	**595.992,80 kWh/y**
Financial info	**€ 243.000**

Partner: OBI GmbH & Co. Deutschland KG

Building: OBI Schwäbisch Gmünd

GreenBuilding 2013

Project : New Building

Address: BuchStrasse - Perlenweg , 73525 Schwäbisch Gmünd

Country: Germany

Building Description and Technical Measures

This new building is a shopping market with all ranges of products for do-it-yourself. The average envelope value amounts to 0,51 W/m²/K. Windows are provided with solar control double glazed unit and aluminium frame with thermal break. The heating system is equipped with a condensing boiler and well dimensioned heat pumps with power regulation. Thermostatic valves have been installed on radiators. Night-drawdown control is active on the system. The ventilation system is provided with heat recovery. The lighting system works with daylight responsive control. Electronic ballasts have replaced magnetic ballasts. This new building will be a model for the standards of all future stores in Europe. The energy factor represents a key factor for achieving a total economic and sustainable profit.

Technical Data

Building use	**Wholesale & Retail**
Area	**5.679 m²**
PEC before or reference value	**172,4 kWh/m²y**
PEC	**77,9 kWh/m²y**
Energy savings %	**54,8 %**
Absolute savings	**547.751,6 kWh/y**
Financial info	**121.900 Euro**

Partner: OBI GmbH & Co. Deutschland KG

Building: OBI Viersen

GreenBuilding 2013

Project : New Building

Address: Kölnische Straße L116, 41747 - Viersen

Country: Germany

Building Description and Technical Measures

This building host a shopping market with all ranges of products for do-it-yourself. It is used 300 days/year for 11 hours/day. It is well insulated and its average U value amounts to 0,4 W/m^2/K. Windows have a solar control double glazed unit. A heat pump is used for the SHW system. The heating system is equipped with a low temperature boiler and thermostatic valves. It is regulated with the out-door temperature. A night-drawdown system control is activated. The lighting system is regulated with a daylight responsive control.

Technical Data

Building use	**Wholesale & Retail**
Area	**6.534 m²**
PEC before or reference value	**171,7 kWh/m²y**
PEC	**116,5 kWh/m²y**
Energy savings %	**32,1 %**
Absolute savings	**360.685,00 kWh/y**
Financial info	**121.900 Euro**

Partner: OKQ8

Building: OKQ8 Häggvik

GreenBuilding 2013

Project : New Building

Address: Signalhornet 1, 191 49 - Sollentuna

Country: Sweden

Building Description and Technical Measures

The building has a concrete slab on the ground with 300 mm insulation of foam; bearing frame of laminated beams and exteriors walls of sheet metal with intermediate 140 mm rock wool insulation. The construction has LED fixture on the canopies and the façade. The windows are 3-pane filled with argon gas and have film and solar shading to reduce heat load thus the need for cooling. The canopy is made of a structural sheeting with overlying insulation, vapour barrier and roofing. Water collector and solar panels are used to heat the rainwater which is reused for car wash. The remaining roof is a green roof. The geothermal heat is used for heating and the free cooling is used to meet the building's cooling load. The used heat pumps have an annual average OP of 3.7. From boreholes retrieved free cooling to cover the need of comfort cooling. Condensate recovery from chiller cold room is used for car wash with 6-12 kW heat output. Solar panels provide hot water for quick wash (automatic car wash). District heating is used for hot water for the shop and the offices. Heat from car wash is recycled because it is considered a process heat.

Technical Data

Building use	**Wholesale & Retail**
Area	**842 m²**
PEC before or reference value	**72,00 kWh/m²y**
PEC	**39,70 kWh/m²y**
Energy savings %	**44,9 %**
Absolute savings	**27.197,00 kWh/y**
Financial info	/

ORDEM DOS ENGENHEIROS REGIÃO NORTE

Partner: Ordem dos Engenheiros Região Norte

Building: Edifício Sede da OERN

GreenBuilding 2012

Project: Refurbishment

Address: Rua Rodrigues Sampaio 123, 4400-425 - Porto

Country: Portugal

Building Description and Technical Measures

The building has an approximately quadrangular plan, with a north eastern façade, and has southeast and northeast adjacent buildings. It comprises 6 floors above ground (floor 0, 1, 2, 3, 4 and 5) which integrates office spaces, training rooms, library, dining room, toilet facilities, equipment and storage rooms; and a basement floor, dedicated to access and technical area of the elevator. Generation of thermal energy (hot and cold water), through two heat pumps with air-water recovery, 4-pipe, with hydraulic group built-in, and a nominal power of 47,4/58,7 kW, in heating, and 40,6 kW in cooling. Terminal equipment (fan coil unit and auditorium handling air unit), which promotes the controlled transfer of thermal energy into spaces (in order to ensure control of thermal conditions). The autonomous climate unit of direct expansion, type split, promotes the acclimatization of a technical area, with a cooling and heating thermal power of 4,1 kW and 3,48 kW, respectively. Diverse ventilation equipment (fans, cross flow ventilation units and auditorium handling air unit), which ensure the inflation of outside air and/or air extraction in several areas of the building.

Technical Data

Building use	**Office**
Area	**942 m²**
PEC before or reference value	**122,46 kWh/m²y**
PEC	**90,57 kWh/m²y**
Energy savings %	**26,12 %**
Absolute savings	**30.040,40kWh/y**
Financial info	/

Partner: Orgelfabriken Fastighets AB

Building: Hönekull 1:599/1

GreenBuilding 2012

Project: Refurbishment

Address: Rådastocksvägen 1, Mölnlycke

Country: Sweden

Building Description and Technical Measures

This new two floors building hosts mostly offices, but also a warehouse and a veterinary clinic at the ground floor. It was constructed in1990 and refurbished in 2012.The envelope of the construction is provided with wind-insulation (300mm loose-wool) and windows are equipped with triple-pane glass, which guarantees a very high performance. To reduce unwanted solar heat gains windows are equipped with external shading devices. The existing oil heating system has been replaced by a geothermal heat pump solution. Also the old fans have been replaced with frequency controlled ones. A new building management system has been installed in order to monitor all energy consumptions. Within two years a solar power plant and a windmill will be installed.

Technical Data

Building use	**Office**
Area	**3.100 m²**
PEC before or reference value	**117,00 kWh/m²y**
PEC	**41,00 kWh/m²y**
Energy savings %	**65 %**
Absolute savings	**228.000 kWh/y**
Financial info	/

Partner: Park Naukowo-Technologiczny "Euro-Centrum" Sp. z o.o.

Building: Budynek biurowo-usługowy nr 8

GreenBuilding 2012

Project: New Building

Address: Ligocka 103, 40568 - Katowice

Country: Poland

Building Description and Technical Measures

The building consists of five floors, four of which are located above ground, with a net floor area of 6.843 m^2. The buildings envelope is very well insulated. The heating system is provided with well dimensioned heating pumps with power regulation and outdoor-temperature regulation. The cooling system is based on a ground source heat pump. Permanent shadings devices help to avoid unwanted solar gains. The ventilation system is provided with heat recovery. The building is also provided with a photovoltaic plant.

Technical Data

Building use	**Office**
Area	**6.843 m²**
PEC before or reference value	**150,00 kWh/m²y**
PEC	**65,17 kWh/m²y**
Energy savings %	**56,55 %**
Absolute savings	**580.492,00 kWh/y**
Financial info	/

Partner: Pietsch Bochum GmbH & Co. KG

Building: Elspermann Grosshandels GmbH & Co. KG

GreenBuilding 2013

Project: New Building

Address: Steiger-Stein-Strasse 1, 44805 - Bochum

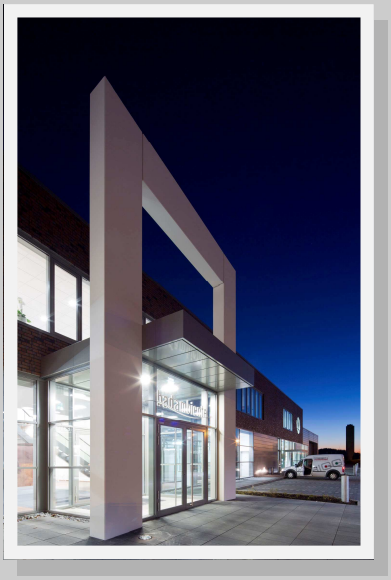
Country: Germany

Building Description and Technical Measures

This new industrial building has a surface of 3.600 m^2. It has a very performing insulation and its average U value amount to 0,21 $W/m^2/K$. All thermal bridges have been localised and eliminated. The heating production system is based on well dimensioned heating pumps with power regulation. For cooling, the building it is equipped with a centralized mechanical plant provided with an air-water heat pump. Permanent shading devices and solar control glazing are used to avoid unwanted solar gains. The ventilation plant is provided with heat recovery system. The building is also equipped with a photovoltaic plant with a nominal efficiency of 90%. Night-drawdown and week-end drawdown are active in order to save energy when people are not in the building. New fluorescent lamps have replaced the old incandescent one. All energy consumptions are recorded.

Technical Data

Building use	**Manufacturing & Industry**
Area	**3.315 m²**
PEC before or reference value	**152,20 kWh/m²y**
PEC	**92,50 kWh/m²y**
Energy savings %	**39,2 %**
Absolute savings	**197.906,00 kWh/y**
Financial info	**€ 140.000**



Partner: PeBri Projektutveckling AB

Building: Backa 23:5

GreenBuilding 2012

Project: Refurbishment

Address: Göteborg

Country: Sweden

Building Description and Technical Measures

The building is a new construction. Energy use for the building has been divided into an office and a warehouse part, with a specific energy for each part. The estimated energy use is for the warehouse portion about 35% below BBR-requirement, and for the office portion approximately 30% below BBR requirement. During the design and the construction of the building, calculations have been continuously carried out in order to ensure that energy used in the building was at least 25% lower than the standards requirements. Monitoring practise is used both as a basis for cost allocation for the tenants, and also as a basis for improvements in the building. The Property Manager is responsible for this follow up.

Technical Data

Building use	**Office**
Area	**7.204 m²**
PEC before or reference value	**kWh/m²y**
PEC	**kWh/m²y**
Energy savings %	**35 %**
Absolute savings	**kWh/y**
Financial info	/

Partner: Platzer Fastigheter

Building: Nordasten 14:1

GreenBuilding 2013

Project: Refurbishment

Address: Göteborg

Country: Sweden

Building Description and Technical Measures

This building consists of two parts, an older one, built in 1905 and a newer part, finished in 1993. The older part develops on four floors and basement, the newer one has five floors and basement. The total leasable area amounts to 11.660 m^2. It is an office building.

The actions taken to save energy are the following:

- Optimization of the HVAC system
- Replacing of the old HVAC control equipment with a new web-access one
- Installation of district cooling

Data consumption are continuously collected and imported into e-report. Audits are carried on in order to detect abnormal consumption or deviations.

Technical Data

Building use	**Office**
Area	**11.600 m²**
PEC before or reference value	**138,80 kWh/m²y**
PEC	**74,00 kWh/m²y**
Energy savings %	**46,6 %**
Absolute savings	**751.680,00 kWh/y**
Financial info	/

Partner: Platzer Fastigheter

Building: Stampen 4:42

GreenBuilding 2013

Project: Refurbishment

Address: Göteborg

Country: Sweden

Building Description and Technical Measures

The real estate property Stampen 4:42 was built in 1940 and totally refurbished in 2001-2004. It is a 7 stories building with a total 8.263 m^2 leasable office area. The real estate includes a garage with 90 parking lots. Different measures have been taken in order to save energy: a heat recovery system has been installed on the air handling unit; heating and cooling system have been balanced; the obsolete HVAC control system has been replaced with a new one with web access; garage area and stairwell have been equipped with presence control for lighting. For energy management, Platzer Fastigheter, uses a software called e-report for follow up the energy consumption, detect abnormal consumption and deviations.

Technical Data

Building use	**Office**
Area	**8.263 m²**
PEC before or reference value	**158,90 kWh/m²y**
PEC	**104,90 kWh/m²y**
Energy savings %	**34,6 %**
Absolute savings	**859.352,00 kWh/y**
Financial info	/

Partner: R.A.I. Betriebsberatungsgesellschaft m.b.H.

Building: Schottenring 19

GreenBuilding 2013

Project: Refurbishment

Address: Schottenring 19, 1010 - Wien

Country: Austria

Building Description and Technical Measures

The L-shaped object consists of a cellar, five floors and an attic. It was built in 1878 as a fruit and flour stock exchange. In the first floor a cafeteria is located. A significant modification of the building was made in 1934. Now it serves as a contemporary attractive office building. The entrance area will be designed as a two-storey representative foyer, including the original entrance, which needs to be laid open again. The explicit interventions having an impact on the energy efficiency of the building operation are related to the improvement of the building envelope as well as on the energy supply through district utilities. The building is supplied by district heating (use of heat from waste incineration) and district cooling. The lighting system is equipped with a selection of efficient lamps (incandescent and partially LED elements). The refurbishment concerns the box-type windows, windows and glazing have been partially replaced with new efficient ones. External walls on the courtyard side and the roof have been newly insulated.

Technical Data

Building use	**Office**
Area	**12.800 m²**
PEC before or reference value	**148,30 kWh/m²y**
PEC	**110,40 kWh/m²y**
Energy savings %	**25,5 %**
Absolute savings	**2.416.686,00 kWh/y**
Financial info	/

Partner: RIELA Karl-Heinz Knoop e.K.

Building: RIELA site Riesenbeck

GreenBuilding 2013

Project: Refurbishment

Address: Hansestraße 14, D-48477 - Riesenbeck

Country: Germany

Building Description and Technical Measures

This new office building is characterized by a modular frame. The area is of 4.086 m^2. High insulation standards have been adopted (U value: 0, 45 $W/m^2/K$). The heating system is equipped with a reversible heat pump. The cooling strategy is comprehensive of automatic external shading, air-water heat pump and room air-conditioners. The lighting system is provided with efficient fluorescent lamps and presence control sensors.

Technical Data

Building use	**Manufacturing & Industry**
Area	**10.359 m²**
PEC before or reference value	**323,14 kWh/m²y**
PEC	**51,60 kWh/m²y**
Energy savings %	**84 %**
Absolute savings	**2.812.500,00 kWh/y**
Financial info	/

Partner: Schwamm & Cie. GbR

Building: Ostspange 8

GreenBuilding 2013

Project: New building

Address: Zur Ostspange 8, 66121 Saarbrücken

Country: Germany

Building Description and Technical Measures

This new commercial building has as priority a rational use of energy. Starting with the use of triple glazing and an improved insulation (envelope average U value is 0,32 W/m²/K), followed by ventilation with heat recovery – with an efficiency of more than 70%) the heating demand is already reduced. This demand is covered by a highly efficient heat pump using the earth as a source and reaching a high COP. Furthermore the heat pump is also foreseen to take care of the cooling demand supplying ceiling which guarantee a comfortable atmosphere in the rooms. The building is also provided with a photovoltaic plant with an absorbing area of 105 m².

Technical Data

Building use	**Wholesale & Retail**
Area	**1.520m²**
PEC before or reference value	**208,2 kWh/m²y**
PEC	**117,2 kWh/m²y**
Energy savings %	**43,7 %**
Absolute savings	**138.384 kWh/y**
Financial info	**48.000 Euro**

Partner: Siemens AG Siemens Real Estate

Building: Gebäude 38

GreenBuilding 2013

Project: New building

Address: Günther-Scharowsky-Str., 91052 - Erlangen

Country: Germany

Building Description and Technical Measures

This new office building is characterized by a modular frame. The area is of 4.086 m^2. High insulation standards have been achieved (U value: 0, 45 W/m2/K). The heating system is equipped with a reversible heat pump. The cooling strategy is comprehensive of automatic external shading, air-water heat pump and room air-conditioners. The lighting system is provided with efficient fluorescent lamps and presence control sensors.

Technical Data

Building use	**Office**
Area	**4.086 m²**
PEC before or reference value	**255,1 kWh/m²y**
PEC	**154,1 kWh/m²y**
Energy savings %	**31,5 %**
Absolute savings	**290.106,00 kWh/y**
Financial info	/

Partner: Siemens AG Siemens Real Estate

Building: Gebäude 64

GreenBuilding 2012

Project: New building

Address: Günther-Scharowsky-Str., 91052 - Erlangen

Country: Germany

Building Description and Technical Measures

The building is a modular type construction made of steel frame. It has a very high insulation standard. The Windows have PVC-frames and shock absorbers for optimized natural ventilation. The building is cooled and heated by VRV reversible heat pumps.

The building is equipped with a presence controls, EIB bus system for lighting and shading.

Technical Data

Building use	**Office**
Area	**663 m²**
PEC before or reference value	**365,40 kWh/m²y**
PEC	**142,20 kWh/m²y**
Energy savings %	**62,8 %**
Absolute savings	**152.212,00 kWh/y**
Financial info	/

SIEMENS

Partner: Siemens AG Siemens Real Estate

Building: KiTa SieKids Amberg

GreenBuilding 2013

Project: New Building

Address: Werner-von-Siemens-Straße 31, 92224 - Amberg

Country: Germany

Building Description and Technical Measures

This new building hosts a day care facility for 61 children. It is a one floor building of about 747 m^2. It is a massive construction with very high insulation standards (U value: 0,24 $W/m^2/K$). Heat bridges have been optimized and all windows equipped with 3-pane glazing. An air-tightness test with Blower Door has been made in order to demonstrate the insulation efficiency.

The building is provided with a combined heat-power generation plant, partially supplied with solar collectors. The air handling unit has heat recovery (efficiency 91%) and a capacity of 1.700 m^3/h. The lighting system is equipped with presence detectors.

Technical Data

Building use	**Education**
Area	**747 m^2**
PEC before or reference value	**163,50 kWh/m^2y**
PEC	**84,10 kWh/m^2y**
Energy savings %	**48,5 %**
Absolute savings	**59.26,00 kWh/y**
Financial info	/

Partner: Siemens AG Siemens Real Estate

Building: MuFu Wegberg

GreenBuilding 2012

Project: New Building

Address: Friedrich-List-Allee 1, 41844 - Wegberg-Wildenrath

Country: Germany

Building Description and Technical Measures

This project concerns a new multifunctional Production building. In order to achieve low consumption values the following characteristics have been adopted : well insulated metal facade, reduced heat bridges by special screws, reduced roof-light to roof ratio, implementation of efficient lighting system, blower door test for proving improved air-tightness of building envelope.

Technical Data

Building use	**Manufacturing & Industry**
Area	**6.579 m²**
PEC before or reference value	**281,60 kWh/m²y**
PEC	**206,00 kWh/m²y**
Energy savings %	**26,9 %**
Absolute savings	**497.969,00 kWh/y**
Financial info	/

Partner: Skanska Commercial Development Nordic

Building: Kv Nereus 1, Byggnad A

GreenBuilding 2012

Project: New building

Address: Styrmansgatan 2, 211 18 - Malmö

Country: Sweden

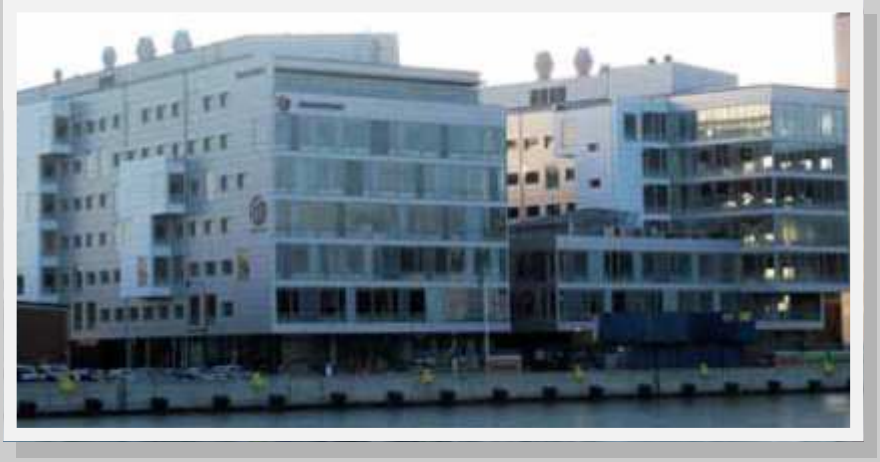
Building Description and Technical Measures

The project is a new construction of an office building. The project is located on block Bassängkajen i Malmö. The building comprises 8 floors offices and public space of approximately 9380 sqm BTA above ground and one garage floor underground.

For this project the average air flow rate during the heating season (q) is 0,62 l/s,m2 thus the requirement is 119 kWh/m2, yr.

Technical Data

Building use	**Office**
Area	**9.380 m²**
PEC before or reference value	**119,00 kWh/m²y**
PEC	**76,00 kWh/m²y**
Energy savings %	**36,13 %**
Absolute savings	**403.340,00 kWh/y**
Financial info	/



Partner: Skanska Commercial Development Nordic

Building: Kv Nereus 1, Byggnad B

GreenBuilding 2012

Project: New building

Address: Neptuniplan 7, 211 18 - Malmö

Country: Sweden

Building Description and Technical Measures

The project is a new construction of an office building. The project is located on block Bassängkajen i Malmö. The building comprises 8 floors offices and public space of approximately 9380 sqm BTA above ground and one garage floor underground.

For this project the average air flow rate during the heating season (q) is 0,62 l/s,m2 thus the requirement is 119 kWh/m2, yr.

Technical Data

Building use	**Office**
Area	**10.180 m²**
PEC before or reference value	**119,00 kWh/m²y**
PEC	**74,00 kWh/m²y**
Energy savings %	**37,82 %**
Absolute savings	**458.100,00 kWh/y**
Financial info	/

Partner: Skanska Commercial Development Finland oy

Building: REC Helsingin Kathy

GreenBuilding 2013

Project: New building

Address: Helsinki

Country: Finland

Building Description and Technical Measures

REC Helsingin Kathy is an office building with underground parking located in Helsinki. The office area amounts to 9.987 m2 and the building consists of 8 floors and 3 garage underfloor levels. Together with its neighbouring sister building Neptun, broadcasts a clear message: you are arrived in the city. The brown façade is patterned with symmetrically positioned sleek rectangular windows, which give to the building a classical inspiration. The inwards-facing faced is bright white, creating a sense of airiness in the courtyard. The chosen heat source is district heating (co-generation of heat and electricity). The primary strategy for cooling is to use district cooling and whenever it is possible free cooling to minimize consumption. Windows are designed with adjustable shades mitigating excessive temperature; glasses are low emissivity ones. The electricity use for ventilation system is minimised by designing low-pressure drop ducts and by using ventilation units with low specific fan power. For lighting, movement and natural lighting sensors are used to keep the use of artificial lighting as lowest as possible. The building automation system serves the building safety, occupants 'well-being and comfort as well as energy saving.

Technical Data

Building use	**Office**
Area	**9.987 m²**
PEC before or reference value	**165,00 kWh/m²y**
PEC	**88,00 kWh/m²y**
Energy savings %	**46 %**
Absolute savings	**768.999,00 kWh/y**
Financial info	/

Partner: Skanska Commercial Development Finland oy

Building: REC Helsingin Neptun

GreenBuilding 2013

Project: New building

Address: Helsinki

Country: Finland

Building Description and Technical Measures

Koy Helsingin Neptun is an office building with underground parking located in Helsinki. The office area amounts to 8.631 m2 and the building consists of 8 floors and 3 garage underfloor levels. In addition to offices the building has a restaurant and a kitchen. Together with its neighbouring sister building Kathy, broadcasts a clear message: you are arrived in the city. The brown façade is patterned with symmetrically positioned sleek rectangular windows, which give to the building a classical inspiration. The inwards-facing faced is bright white, creating a sense of airiness in the courtyard. The chosen heat source is district heating (cogeneration of heat and electricity). The primary strategy for cooling is to use district cooling and whenever it is possible free cooling to minimize consumption. Windows are designed with adjustable shades mitigating excessive temperature; glasses are low emissivity ones. The electricity use for ventilation system is minimised by designing low-pressure drop ducts and by using ventilation units with low specific fan power. For lighting, movement and natural lighting sensors are used to keep the use of artificial lighting as lowest as possible. The building automation system serves the building safety, occupants 'well-being and comfort as well as energy saving.

Technical Data

Building use	**Office**
Area	**8.631 m²**
PEC before or reference value	**137,00 kWh/m²y**
PEC	**76,00 kWh/m²y**
Energy savings %	**44 %**
Absolute savings	**526.491,00 kWh/y**
Financial info	/

Partner: Skanska Installation AB

Building: Kv Vinkeln 1

GreenBuilding 2012

Project: Refurbishment

Address: Malmö

Country: Sweden

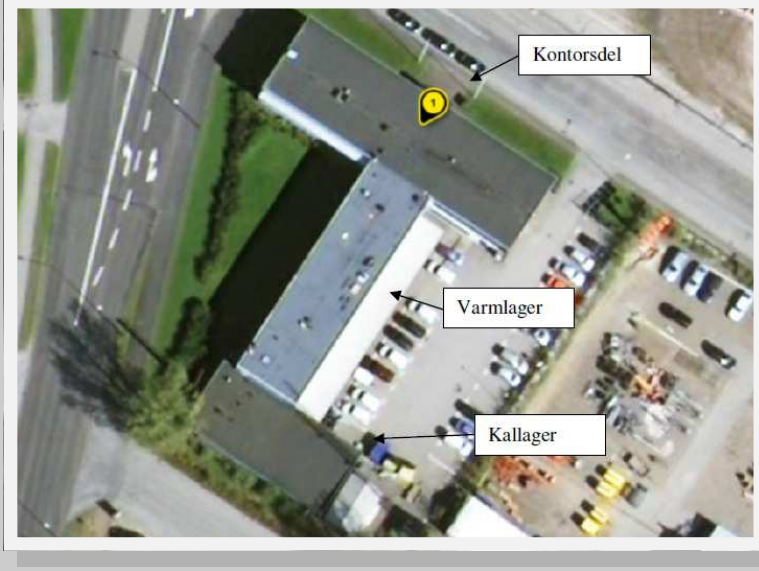
Building Description and Technical Measures

This application relates to an existing building, Kv Vinkeln, owned by Skanska Installation. It is an office building with related warehouse. The building is located in Malmoe. The building comprises two floors of approximately 1.405 m^2 Atemp. In 2008 the building had an energy consumption of 239 kWh/m^2.

A number of different energy reduction actions have been carried out over the last two years, 2010-2012. Measures implemented are for example new windows, new control functions, installations of VAV and balancing of the heating system.

Technical Data

Building use	**Office**
Area	**1.405 m²**
PEC before or reference value	**239,00 kWh/m²y**
PEC	**163,00 kWh/m²y**
Energy savings %	**31,8 %**
Absolute savings	**106.780,00 kWh/y**
Financial info	/



Partner: Skanska Property Hungary Ltd.

Building: Green House

GreenBuilding 2013

Project: New building

Address: Kasák Lajos utca 19-25, 1113 Budapest

Country: HUNGARY

Building Description and Technical Measures

Green House is a one-phase class 'A' office development located on Kassàk Lajos street, parallel to the main office corridor of Budapest. It has 7 levels above ground and 250 parking lots available on the 3 underground levels. Heating is supplied by district heating. The building is equipped with a geothermal cooling system for the AHU with a double rotating exchanger. Chilled beams provide cooling energy, the hydronics heating system provides heating on the premises. Occupancy sensors and daylight response controls are installed in order to save electricity. Automatic sun shades and the high efficiency lighting system provide glare control. Windows opening sensors control the local heating and cooling system. Solar collectors are located on the roof. The building is easily accessible by public transportation, by car and also by bicycle.

Technical Data

Building use	**Office**
Area	**18.216 m²**
PEC before or reference value	**132,0 kWh/m²y**
PEC	**66,3 kWh/m²y**
Energy savings %	**49,7 %**
Absolute savings	**1.196.791,2 kWh/y**
Financial info	**Euro 367.000**

Partner: Skanska Property Poland

Building: Atrium I

GreenBuilding : 2013

Project: New Building

Address: Al. Jana Pawła II 17, 00-854 - Warsaw

Country : Poland

Building Description and Technical Measures

This building offers 16.300 m^2 of office space designed with care for the maximum comfort of future tenants and to ensure convenient and practical arrangement of the interior space. The building also includes use of natural resources: geothermal cooling and heating system, photovoltaic solar panels, free cooling system. Grey and rain water is used for flushing toilets, cleaning purposes and irrigation. The envelope has been designed to minimise the use of energy for heating/cooling. The façade is equipped glasses with a low solar energy transmittance. Electric meters have been installed on main systems. To improve control over the energy use all the meters have been connected to the Building Management System (BMS).

Technical Data

Building use	**Office**
Area	**16.300 m²**
PEC before or reference value	**227,47 kWh/m²y**
PEC	**136,79 kWh/m²y**
Energy savings %	**39,9 %**
Absolute savings	**1.476.943,00 kWh/y**
Financial info	/

Partner: Skanska Property Poland

Building: GCO Green Corner

GreenBuilding 2013

Project: New building

Address: Chłodna 52, 00-872 - Warszawa

Country: Poland

Building Description and Technical Measures

Green Corner is an A-class building located in the business district of Warsaw. This office building has been designed with care for the maximum comfort of future tenants. Its excellent location enables access to public transport. The following are the building's features and, at the same time, its main advantage: modern and innovative architecture, excellent location, a glazed façade to ensure daylight access, freedom to arrange the space on each storey, a two-storey underground car park and an above-ground car park, a Building management System (BMS). Each office has: a suspended ceiling, an air conditioning system with central humidity control, lighting with an luminance of 500 lux, a raised floor, a large clear height (2700 mm), electrical wiring and telecom cables in floor boxes.

The main energy performance measures/equipment which have been adopted: windows are double glazed with a low solar energy transmittance coeffi-

Technical Data

Building use	**Office**
Area	**46.000 m²**
PEC before or reference value	**134,90 kWh/m²y**
PEC	**97,4 kWh/m²y**
Energy savings %	**28 %**
Absolute savings	**1.725.000,00 kWh/y**
Financial info	/

Partner: Skanska Property Poland

Building: Green Horizon A

GreenBuilding 2013

Project: New building

Address: Pomorska 106, 91-402 - Łódź

Country: Poland

Building Description and Technical Measures

Green Horizon A in an A-class building located in the business district of Łódź. The building offers 23.000 m2 of office space designed with care for the maximum comfort of future tenants. The construction has a good thermal insulation to reduce heat loss in winter. Windows are double glazed with a low solar energy transmittance coefficient. Offices are equipped with energy-efficient lamps. To improve control over energy usage all the meters are connected to the Building Management System (BMS). A rotary heat exchanger that enables highly efficient heat and humidity recovery was installed in the air handling unit. The air conditioning is based on four-pipe fan coil units. The high-efficiency chillers are connected to the automation system which adapts their operation to the actual need of the facility. Also, chilled water pumps are equipped with inverters which adapt their operation to the refrigerant demand of building.

The main energy performance measures/equipment which have been adopted: windows are double glazed with a low solar energy transmittance coefficient (g=0,38); heat loss in the buildings entrance zone is reduced by installing revolving doors that protect the interior of the building from outdoor conditions; lighting motion sensors were installed in the garages and toilets; electric meters are installed on main systems; a rotary heat exchanger, which enables highly efficient heat and humidity recovery, is installed in the air handling unit; the air conditioning system is based on chilling beams in office area and four-pipe fan coil units in the ground floor with individual temperature adjustment for each room; chilled water pumps are equipped with inverters which adapt their operation to the refrigerant demand of the building.

Technical Data

Building use	**Office**
Area	**23.000 m²**
PEC before or reference value	**900,60 kWh/m²y**
PEC	**582,70 kWh/m²y**
Energy savings %	**34,8 %**
Absolute savings	**9.297.692,00 kWh/y**
Financial info	/

Partner: Skanska Property Poland

Building: Green Horizon B

GreenBuilding 2013

Project: New building

Address: Pomorska 106, 91-402 - Łódź

Country: Poland

Building Description and Technical Measures

Green Horizon B in an B-class building located in the business district of Łódź. The building offers 23.000 m2 of office space designed with care for the maximum comfort of future tenants. The construction has a good thermal insulation to reduce heat loss in winter. Windows are double glazed with a low solar energy transmittance coefficient. Offices are equipped with energy-efficient lamps. To improve control over energy usage all the meters are connected to the Building Management System (BMS). A rotary heat exchanger that enables highly efficient heat and humidity recovery was installed in the air handling unit. The air conditioning is based on four-pipe fan coil units. The high-efficiency chillers are connected to the automation system which adapts their operation to the actual need of the facility. Also, chilled water pumps are equipped with inverters which adapt their operation to the refrigerant demand of building.

The main energy performance measures/equipment which have been adopted: windows are double glazed with a low solar energy transmittance coefficient (g=0,38); heat loss in the buildings entrance zone is reduced by installing revolving doors that protect the interior of the building from outdoor conditions; lighting motion sensors were installed in the garages and toilets; electric meters are installed on main systems; a rotary heat exchanger, which enables highly efficient heat and humidity recovery, is installed in the air handling unit; the air conditioning system is based on chilling beams in office area and four-pipe fan coil units in the ground floor with individual temperature adjustment for each room; chilled water pumps are equipped with inverters which adapt their operation to the refrigerant demand of the building.

Technical Data

Building use	**Office**
Area	**13.000 m²**
PEC before or reference value	**693,00 kWh/m²y**
PEC	**462,50 kWh/m²y**
Energy savings %	**33 %**
Absolute savings	**5.089.971,00 kWh/y**
Financial info	/

Partner: Skanska Property Poland

Building: Green Towers B

GreenBuilding 2013

Project : New Building

Address: Strzegomska 36, 53-611 - Wrocław

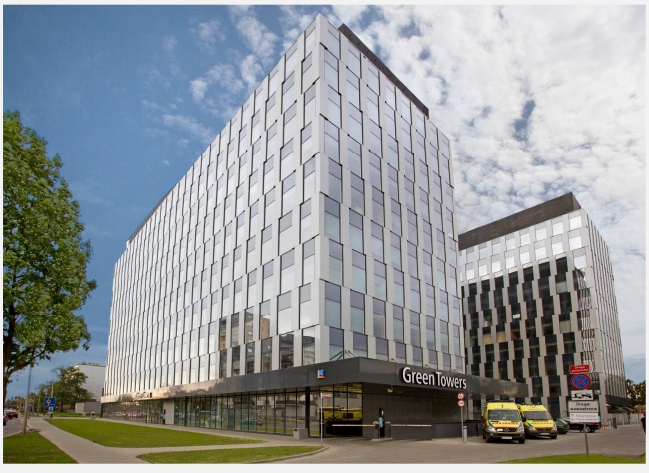
Country: Poland

Building Description and Technical Measures

Green Towers is located in the business district of Wroclaw in Poland. The buildings are surrounded by green areas and elements of small architecture. The envelope of the building has been designed to minimise the use of energy for heating/cooling. The windows are double glazed with a low solar energy transmittance coefficient. Heat loss in the building entrance zone is reduced by installing revolving doors that protects the interior of the building from outdoor conditions. The building glazed faced provides the interior of the building with natural light while reducing the use of artificial light. The office spaces are equipped with energy efficient-lamps. Lighting motion sensors are installed in garage and toilets. Electricity meters were installed on main system. To improve control over the energy usage all the meters were connected to the Building management System. Building Heat is supplied by district heating. On the air handling unit a rotary heat exchanger, that enables highly efficient heat and humidity recovery, was installed. The system is also equipped with energy efficient fans. People working in the building are made aware and informed of how to use the different systems of the building to reduce energy consumption.

Technical Data

Building use	**Office**
Area	**11.592 m²**
PEC before or reference value	**243,50 kWh/m²y**
PEC	**174,10 kWh/m²y**
Energy savings %	**28,5 %**
Absolute savings	**1.167.947,00 kWh/y**
Financial info	/



Partner: Skanska Property Poland

Building: Malta House

GreenBuilding 2013

Project: New building

Address: Abp. A. Obraniaka, 61-245 - Poznań

Country: Poland

Building Description and Technical Measures

Malta House in an A-class building located in the business district of Łódź. The building offers 14.700 m^2 of office space designed with care for the maximum comfort of future tenants; excellent location enables access to public transport. The construction has a good thermal insulation to reduce heat loss in winter. Windows are double glazed with a low solar energy transmittance coefficient. Offices are equipped with energy-efficient lamps. There are 8 energy-saving, high speed elevators. To improve control over energy usage all the meters are connected to the Building Management System (BMS). A rotary heat exchanger that enables highly efficient heat and humidity recovery was installed in the air handling unit. The air conditioning is based on four-pipe fan coil units. The high-efficiency chillers are connected to the automation system which adapts their operation to the actual need of the facility. Also, chilled water pumps are equipped with inverters which adapt their operation to the refrigerant demand of building.

The main energy performance measures/equipment which have been adopted: windows are double glazed with a low solar energy transmittance coefficient (g=0,38); heat loss in the buildings entrance zone is reduced by installing revolving doors that protect the interior of the building from outdoor conditions; lighting motion sensors were installed in the garages and toilets; electric meters are installed on main systems; a rotary heat exchanger, which enables highly efficient heat and humidity recovery, is installed in the air handling unit; the air conditioning system is based on chilling beams in office area and four-pipe fan coil units in the ground floor with individual temperature adjustment for each room; chilled water pumps are equipped with inverters which adapt their operation to the refrigerant demand of the building.

Technical Data

Building use	**Office**
Area	**14.700 m²**
PEC before or reference value	**477,70 kWh/m²y**
PEC	**639,00 kWh/m²y**
Energy savings %	**27,8 %**

Partner: A. Sochor & Co Gesellschaft m.b.H

Building: Baustoffhandel A. Sochor & Co GmbH

GreenBuilding 2012

Project : New Building

Address: Triestestrasse 12, 1100 - Wien-Favoriten

Country: Austria

Building Description and Technical Measures

This project concerns a building complex hosting delivery, purchasing, sales areas warehouse and parking. The project will provide important logistical improvements: the distance between the purchase of goods, transmission of delivery and goods issue will be reduced drastically. This means a substantial simplification for all staff members of the department coordinating customer purchasing, but also for the costumers themselves. On a storage surface of 20.000 m^2, 14.000 pallets will be stored dry and safe. A 1.000 m^2 showroom and an 800 m^2 self-service area will be available for private costumers. During the planning process, great priority has been given to the implementation of energy-saving measures. Considering the use of the building, the shell has been optimized with respect to energy consumption. Average U value for the envelope amounts to 0,28 $W/m^2/K$ for the office area and to 0,35 $W/m^2/K$ for the retail area. The heating system of both building is equipped with heat pump and the ventilation plant is provided with heat recovery. Transparent elements of the envelope are provided with external shading to avoid unwanted solar gains.

Technical Data

Building use	**Wholesale & Retail**
Area	**868,50 m²**
PEC before or reference value	**321,05 kWh/m²y**
PEC	**191,00 kWh/m²y**
Energy savings %	**40,52 %**
Absolute savings	**112.981,00 kWh/y**
Financial info	/

Partner: A. Sochor & Co Gesellschaft m.b.H

Building: Baustoffhandel A. Sochor & Co GmbH Bldg. 2

GreenBuilding 2012

Project : New Building

Address: Triestestrasse 12, 1100 - Wien-Favoriten

Country: Austria

Building Description and Technical Measures

This project concerns a building complex hosting delivery, purchasing, sales areas warehouse and parking. The project will provide important logistical improvements: the distance between the purchase of goods, transmission of delivery and goods issue will be reduced drastically. This means a substantial simplification for all staff members of the department coordinating customer purchasing, but also for the costumers themselves. On a storage surface of 20.000 m^2, 14.000 pallets will be stored dry and safe. A 1.000 m^2 showroom and an 800 m2 self-service area will be available for private costumers. During the planning process, great priority has been given to the implementation of energy-saving measures. Considering the use of the building, the shell has been optimized with respect to energy consumption. Average U value for the envelope amounts to 0,28 $W/m^2/K$ for the office area and to 0,35 $W/m^2/K$ for the retail area. The heating system of both building is equipped with heat pump and the ventilation plant is provided with heat recovery. Transparent elements of the envelope are provided with external shading to avoid unwanted solar gains.

Technical Data

Building use	**Office**
Area	**2350 m²**
PEC before or reference value	**185,33 kWh/m²y**
PEC	**100,28 kWh/m²y**
Energy savings %	**45,9 %**
Absolute savings	**85.054,00 kWh/y**
Financial info	/

Partner: Stadt Bergheim

Building: Kita "Kleine Strolche"in Ahe

GreenBuilding 2013

Project: New building

Address: Am Kapellenkreuz, 50127 - Bergheim Ahe

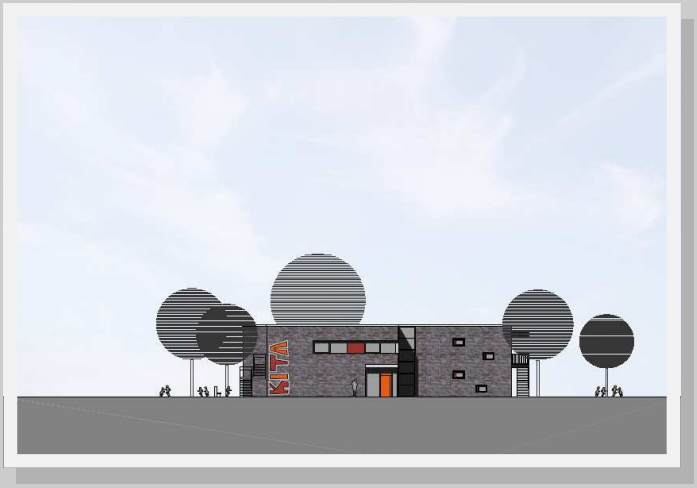
Country: Germany

Building Description and Technical Measures

This building has been newly erected in 2013 and will be used as a Kindergarten. The building has been very well insulated and equipped with heat mirror double glazed unit. The average U-value of the envelope amounts to 0,36 W/m²/K. Heating energy is supplied by an electrical heat pump. The system has an optimized regulation system based on the out-door temperature. The ventilation plant is provided with heat recovery (75% efficiency). Occupancy linking controls has been installed. New efficient fluorescent lamps have replaced the old incandescent ones. Multi-function devices have replaced the old separate single-function ones. The average technical life of the equipment amounts to 25 years.

Technical Data

Building use	**Education**
Area	**932 m²**
PEC before or reference value	**183,00 kWh/m²y**
PEC	**131,00 kWh/m²y**
Energy savings %	**28,4 %**
Absolute savings	**48.464,00 kWh/y**
Financial info	**€ 82.960,00**



Partner: Stadt Bergheim

Building: Kita "Rappelkiste" in Quadrath-Ichendorf

GreenBuilding 2013

Project: New building

Address: Rilkestraße 8, 50127 - Bergheim Quadrath-Ichendorf

Country: Germany

Building Description and Technical Measures

This building has been newly erected in 2013 and will be used as a Kindergarten. The building has been very well insulated; windows have a wood-aluminium frame with thermal break and are equipped with heat mirror double glazed unit. The average U-value of the envelope amounts to 0,34 W/m^2/K. Heating energy is supplied by well dimensioned heating pumps with power regulation. The system has an optimized regulation system based on the out-door temperature. The ventilation plant is provided with heat recovery (75% efficiency). Occupancy linking controls have been installed. New efficient fluorescent lamps have replaced the old incandescent ones. Multi-function devices have replaced the old separate single-function ones. The average technical life of the equipment amounts to 25 years.

Technical Data

Building use	**Education**
Area	**997 m²**
PEC before or reference value	**182,00 kWh/m²y**
PEC	**126,00 kWh/m²y**
Energy savings %	**30,7 %**
Absolute savings	**55.832,00 kWh/y**
Financial info	**€ 82.960,00**

Partner: Stadt Bergheim

Building: Kita "Tigermaus" in Zieverich

GreenBuilding 2013

Project: New building

Address: Hermann- Stehr-Str. 8, 50126 - Bergheim Zieverich

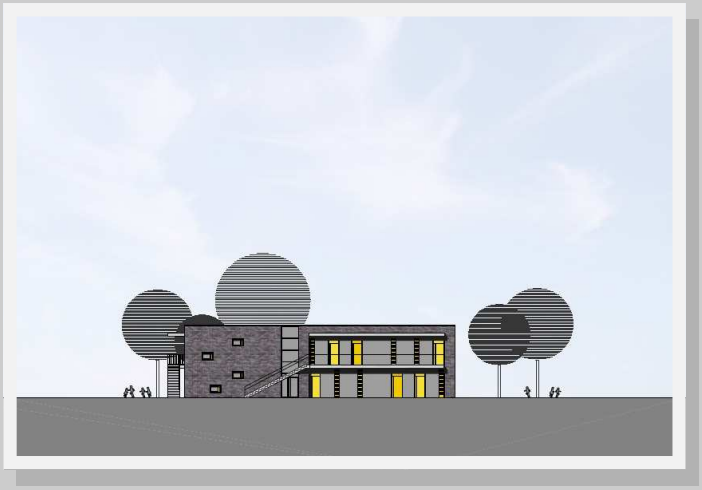
Country: Germany

Building Description and Technical Measures

This building has been newly erected in 2013 and will be used as a Kindergarten. The building has been very well insulated; windows have a wood-aluminium frame with thermal break and are equipped with heat mirror double glazed unit. The average U-value of the envelope amounts to 0,34 W/m^2/K. Heating energy is supplied by well dimensioned heating pumps with power regulation. The system has an optimized regulation system based on the out-door temperature. The ventilation plant is provided with heat recovery (75% efficiency). Occupancy linking controls have been installed. New efficient fluorescent lamps have replaced the old incandescent ones. Multi-function devices have replaced the old separate single-function ones. The average technical life of the equipment amounts to 25 years.

Technical Data

Building use	**Education**
Area	**945 m²**
PEC before or reference value	**182,00 kWh/m²y**
PEC	**126,00 kWh/m²y**
Energy savings %	**30,7 %**
Absolute savings	**52.920,00 kWh/y**
Financial info	**€ 82.960,00**



Partner: Stadt Bergheim

Building: Neubau Kindertagesstätte Pirateninsel

GreenBuilding 2013

Project: New building

Address: Silverbergstraße 28, 50126 - Bergheim Niederaußem

Country: Germany

Building Description and Technical Measures

This project concerns a kindergarten. The building is very well insulated. Windows are provided with heat mirror double gazed unit. The average envelope U value amounts to 0,34 W/m^2/K. The heating system is supplied with well dimensioned heat pumps with power regulation; the ventilation system is provided with heat recovery. The control system is equipped with occupancy linking controls. The lighting system has fluorescent lamps with electronic ballasts. All the technical equipment has 25 years of expected life.

Technical Data

Building use	**Education**
Area	**791,60 m²**
PEC before or reference value	**182,10 kWh/m²y**
PEC	**129,80 kWh/m²y**
Energy savings %	**28,7 %**
Absolute savings	**41.455,00 kWh/y**
Financial info	**€ 69.500,00**

Partner: Stadtkrankenhaus Schwabach GmbH

Building: KHSC; SKH Schwabach

GreenBuilding 2013

Project: Refurbishment

Address: Regelsbacher Straße 7, 91126 - Schwabach

Country: Germany

Building Description and Technical Measures

This project concerns the refurbishment of an existing hospital that was built in several stages between 1937 and 2006. The building has a gross floor area of 27.468 m_2 and hosts beds for 170 patients. Annually the hospital treats 7.000 patients and approximately 12.000 out-patients. The hospital works also as educational structure for the Friedrich – Alexander University of Erlangen - Nuremberg. The renovation started in 2009 with highly efficient measures. The average envelope U value amounts to 0,7 W/m^2/K. The heating production system is a tri-cogeneration plant; well dimensioned heating pump with power regulation have been installed. The building is also equipped with a centralized mechanical plant and with a ventilation plant. As renewable source a photovoltaic plant has been installed (340 m^2 absorbing area, 34 kW installed power).

Technical Data

Building use	**Healthcare & Social Work**
Area	**16.819 m²**
PEC before or reference value	**624, 00kWh/m²y**
PEC	**421,00 kWh/m²y**
Energy savings %	**32,5 %**
Absolute savings	**3.403.100,00 kWh/y**
Financial info	/

Partner: Storchengrund GmbH & Co KG

Building: Star Inn Hotel Schönbrunn

GreenBuilding 2013

Project: New Building

Address: Linke Wienzeile 224, 1150 - Vienna

Country: Austria

Building Description and Technical Measures

"The Star Inn Hotel "Schönbrunn" is conveniently situated near the west entrance/gateway of Vienna. The hotel has 283 guest rooms, including six suites, a restaurant plus kitchen, associated ancillary spaces, two seminar rooms in the podium and 100 m^2 of office accommodation at rooftop level.

Compact building envelope, highly-insulated exterior walls and low-e-glazing guarantee low heating energy demand during the winter period. Glazing with reduced g-values (0.24 - 0.45) lower the cooling load in summer. The building is connected to local district heating, using waste heat from waste incineration. The ventilation systems are equipped with heat recovery (cross-flow heat-exchanger). The electrical energy demand is reduced via energy-efficient lighting and equipment (LCD-TVs, no minibars).

Technical Data

Building use	**Hotel & Accommodation**
Area	**12.051 m^2**
PEC before or reference value	**kWh/m^2y**
PEC	**kWh/m^2y**
Energy savings %	**55,2 %**
Absolute savings	**kWh/y**
Financial info	/

Partner: SveaReal

Building: Bägaren

GreenBuilding 2013

Project: Refurbishment

Address: Kv Bägaren 3, Norrköping

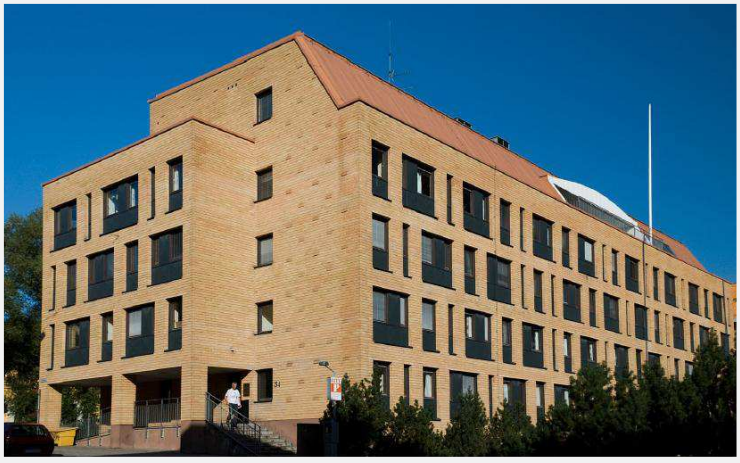
Country : Sweden

Building Description and Technical Measures

This office building was built in 1985. It has five floors and area of 3.921 m^2. A total of ten tenants are located in it; all of them are office companies. The structure is made of concrete. The ventilation system consists of a supply/exhaust air unit with heat exchanger. The heating system is water-based, heat comes from district heating and ventilation. On hot water circulation system several heat exchanger are placed: one for the radiators, one for ventilation and one for domestic hot water. New control system has been installed for water temperature.

Technical Data

Building use	**Office**
Area	**3.921m²**
PEC before or reference value	**145,30 kWh/m²y**
PEC	**105,00 kWh/m²y**
Energy savings %	**28 %**
Absolute savings	**153.816,30 kWh/y**
Financial info	**/**



Partner: SveaReal

Building: Svinbådan 5

GreenBuilding 2013

Project: Refurbishment

Address: Malmo

Country: Sweden

This building is an office and storage property. It was built in 1963 and renovated during 2010. The building has one floor and area of 2.639 m^2. A total of two tenants are located in the building, one concerns consumables stock and the other tenants working in the fish industry. The building's structure consists of concrete and metal sheets. The heating system is water-based and heat is supplied by district heating. Hot water circulation systems are used with 3 hot water heat exchangers; one for the radiators, one for hot water for ventilation and one for domestic hot water. During the refurbishment all components of the heating plant as heat exchangers, new-pressure controlled pumps, new shunt groups and new balancing valves have been replaced.

Technical Data

Building use	**Logistics & Storage**
Area	**2.630 m²**
PEC before or reference value	**77,63 kWh/m²y**
PEC	**44,00 kWh/m²y**
Energy savings %	**43,6 %**
Absolute savings	**88. 446,90 kWh/y**
Financial info	/

Partner: Svenska Kyrkan I Göteborg

Building: Näset 51:54

GreenBuilding 2012

Project: Refurbishment

Address: Västra Frölunda, Hammarvägen 6, Göteborg

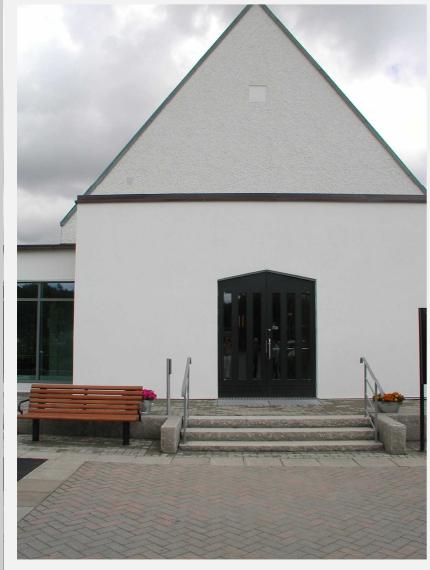
Country: Sweden

Building Description and Technical Measures

This project concerns a church in Näset with secondary areas for related functions. The church was built in 1967 and the secondary area were added in 1984. These areas functions as expedition, kindergarten and offices for the employees. In the end of 2009 the oil furnace was replaced with a geothermal heat pump and sun collectors were installed on the roof in order to reduce the energy consumption. The result was a 62% reduction of used energy for heating and hot water production compared to the years 2006-2008. The specific energy consumption was before the installation 278,4 kWh/m^2, year and after the installation it have been reduced to 105,1 kWh/m^2, year. The Swedish Church in Gothenburg will in the coming years ahead be implementing new, energy efficient technology in order to replace fossil based fuels and electric powered boilers. In addition to this, the heating's systems are being tuned and ventilation units serviced and possibly replaced if found inefficient.

Technical Data

Building use	**Other (Church)**
Area	**13.642 m²**
PEC before or reference value	**120,00 kWh/m²y**
PEC	**58,00 kWh/m²y**
Energy savings %	**48,3 %**
Absolute savings	**845.804 kWh/y**
Financial info	/



Partner: Swedavia AB

Building: Hotell Clarion Arlanda Airport

GreenBuilding 2013

Project: New Building

Address: Tornvägen 2, 190 45 - Stockholm-Arlanda

Country: Sweden

Building Description and Technical Measures

The building comprises a total of 29.650 m² and is located at Arlanda Airport north of Stockholm, Sweden. The building consists of approx. 15.000 m² hotel area and 13.000 m² conference and restaurant. Areas. The building is equipped with efficient heat recovery systems, mainly through an efficient rotary heat exchanger but also through heat recovery of condenser heat from the restaurants cooling system. All major function areas in the building is served by demand controlled ventilation and for example the control of individual hotel rooms is connected to the hotels booking system so that temperature control set points is offset when a room is not booked. In similar fashion the air flow is reduced when a room is unoccupied. The building envelope has been designed tom minimise heat losses and windows with low shading coefficient to minimise cooling during the warm season.

The building is connected to district heating and cooling and is also connected to Arlanda Airports geothermal energy facility which provides both heating and cooling to large parts of Arlanda Airport.

Technical Data

Building use	**Hotel & Accommodation**
Area	**29.650 m²**
PEC before or reference value	**138,90 kWh/m²y**
PEC	**81,01 kWh/m²y**
Energy savings %	**41,6 %**
Absolute savings	**1.719.000,00 kWh/y**
Financial info	/

Partner: Telge Fastigheter AB

Building: Glasberga 1:23

GreenBuilding 2013

Project: New Building

Address: Glasbygatan 2, 152 59 - Södertälje

Country: Sweden

Building Description and Technical Measures

Glasberga förskola is a new two floor building designed for preschool operation. The building is heated with district heating. The heat is distributed via radiators and the heat flow is variable dependent on temperature. An efficient heat recovery system is provided in the heating system. The insulation of the building envelope is good and the infiltration is low.

Technical Data

Building use	**Education**
Area	**1.337 m²**
PEC before or reference value	**105,00 kWh/m²y**
PEC	**61,20 kWh/m²y**
Energy savings %	**41,7 %**
Absolute savings	**58.560,00 kWh/y**
Financial info	/

Partner: Telge Fastigheter AB

Building: Helenelundsskolan

GreenBuilding 2013

Project: Refurbishment

Address: Vatt Annas väg 5-7, 151 55 - Södertälje

Country: Sweden

Building Description and Technical Measures

Telge Fastigheter AB is a leading real estate company in Södertälje and part of the Telge Group which is owned by the municipality of Södertälje.

Helenelundsskolan is a school with about 310 pupils plus personnel. The building was built in 1983 and has a total area of 4.145 m^2. The building is supplied by a district heating system. The project started during 2007 with the objective to save energy. The project includes the installation of new ventilation units with heat recovery (FTX) and VAV -regulation. After the project was finished the specific use of energy for Helenelundsskolan resulted 132 kWh/m^2, which is 41% lower than year 2007.

Technical Data

Building use	**Education**
Area	**4.145 m²**
PEC before or reference value	**224,00 kWh/m²y**
PEC	**132,00 kWh/m²y**
Energy savings %	**41 %**
Absolute savings	**381.340,00 kWh/y**
Financial info	/

Partner: Telge Fastigheter AB

Building: KV Glasberga

GreenBuilding 2012

Project: New Building

Address: Glasbygatan 2, 152 59 - Södertälje

Country: Sweden

Building Description and Technical Measures

It is a concrete building developed on three floor (KV Glasberga in Södertälje). KV Glasberga is a nursing home with about 160 people (healthcare and housing) using the building every day. The building was built in 2012 and has a total area 5360 m²A temp distributed in 3189m² of office and 2139 m² of apartments. The building`s heating system consists of district heating and the heat is distributed by water radiator systems. The ventilation system (FTX) has a constant airflow (VAC) for the whole building. For this building the average air flow rate during the heating season (q) is 0,56 l/s, m²Atemp. The conclusion is that the BBR requirement is 113 kWh/m²/a weighted value for offices and apartments) and the estimated energy use for building (with margin + 10%) is 80 kWh /m²,yr. The value meets Green Building requirements - at least 25% less than the BBR 16.

Technical Data

Building use	**Education**
Area	**5.360 m²**
PEC before or reference value	**113,00 kWh/m²y**
PEC	**80,00 kWh/m²y**
Energy savings %	**29,2 %**
Absolute savings	**407.360,00 kWh/y**
Financial info	/

Partner: Telge Fastigheter AB

Building: Noshörningen 14

GreenBuilding 2013

Project: New Building

Address: Nysättravägen 21, 152 49 - Södertälje

Country: Sweden

Building Description and Technical Measures

Noshörningen 14 is a new three floor building designed for primary and secondary activities. The building is heated through district heating. The heat is distributed via radiators and the heat flow is variable dependent on temperature. The heat recovery system is provided with heat recovery (85% efficiency). The building is very well insulated and is equipped with triple glazed units.

Technical Data

Building use	**Education**
Area	**8.050 m²**
PEC before or reference value	**100,00 kWh/m²y**
PEC	**55,00 kWh/m²y**
Energy savings %	**45 %**
Absolute savings	**362.250,00 kWh/y**
Financial info	/

Partner: Telge Fastigheter AB

Building: Skolhuset 5

GreenBuilding 2013

Project: New Building

Address: Solvägen 11, 150 21 - Mölnbo

Country: Sweden

Building Description and Technical Measures

Skolhuset 5 is a new two floor building designed for pre-school activities. The building is heated through district heating. The heat is distributed via radiators and the heat flow is variable dependent on temperature. The heat recovery system is provided with heat recovery (87% efficiency). The building is very well insulated and the heat loses very low.

Technical Data

Building use	**Education**
Area	**1.455 m²**
PEC before or reference value	**102,00 kWh/m²y**
PEC	**74,00 kWh/m²y**
Energy savings %	**27,4 %**
Absolute savings	**40.740,00 kWh/y**
Financial info	/

Partner: Telge Fastigheter AB

Building: Södertälje Årsboken 31

GreenBuilding 2012

Project: Refurbishment

Address: Årsboken 31, 151 33 - Södertälje

Country: Sweden

Building Description and Technical Measures

Södertälje Årsboken 31 is a kindergarten. The building was built in 1991 and has a total area of 673 m^2 The project includes installation of a heat pump, change of heat distribution, installation of a heat exchanger for recovering of heat from the ventilation system, insulation for the attic, etc.

Technical Data

Building use	**Education**
Area	**673 m²**
PEC before or reference value	**205,00 kWh/m²y**
PEC	**59,00 kWh/m²y**
Energy savings %	**71,22 %**
Absolute savings	**98.258,00 kWh/y**
Financial info	/

Partner: Telge Fastigheter AB

Building: Tavestakolan 3

GreenBuilding 2013

Project: New Building

Address: Rönnvägen 7, 153 36 - Järna

Country: Sweden

Building Description and Technical Measures

Tavestakolan 3 is a new two floor building designed for primary and secondary activities. The building is heated through district heating. The heat is distributed via radiators and the heat flow is variable dependent on temperature. The heat recovery system is provided with heat recovery (80% efficiency). The building is very well insulated and the heat loses very low.

Technical Data

Building use	**Education**
Area	**1.674 m²**
PEC before or reference value	**109,20 kWh/m²y**
PEC	**78,11 kWh/m²y**
Energy savings %	**28,5 %**
Absolute savings	**313.588,00 kWh/y**
Financial info	/

Partner: Telge Fastigheter AB

Building: Väghyveln 14

GreenBuilding 2013

Project: New Building

Address: Morabergsvägen 6, 152 42 - Södertälje

Country: Sweden

Building Description and Technical Measures

Kv Väghyveln is a two floor building designed for secondary school activities. It is used 200 days/ years for 9 hours/day. The building is heated through district heating. The heat is distributed via radiators and the heat flow is variable dependent on temperature. An efficient heat recovery system is provided on the heating system (88% efficiency). The insulation of the envelope is very performing with very low heat loses.

Technical Data

Building use	**Education**
Area	**2.071 m²**
PEC before or reference value	**112,00 kWh/m²y**
PEC	**57,00 kWh/m²y**
Energy savings %	**49,1 %**
Absolute savings	**113.905,00 kWh/y**
Financial info	/

Partner: TOKAN 5 AB (Gotska Fastighets AB)

Building: Fjällskivlingen 4

GreenBuilding 2013

Project: New Building

Address: Änghagens Handelsplats, 53140 - Lidköping

Country: Sweden

Building Description and Technical Measures

Fjällskivlingen 4 is a commercial building located in Lidköping, in the central parts of southern Sweden. To reduce the energy consumption compared to the BBR limit value, the building is constructed with 200 mm of sandwich wall type and high performance insulation for the roof surface. The lighting system is equipped with presence control sensors. The excess heat produced by the supermarket is recovered and used as a complement to the district heating. All data consumptions are registered so that trends can be illustrated and deviations easily discovered. Once a year a monitoring meeting is held, with representatives from both owner and housekeeper. The housekeeper brings suggestions for development and further energy saving. The final decision accomplishing the measures is on the owner.

Technical Data

Building use	**Wholesale & Retail**
Area	**10.738 m²**
PEC before or reference value	**110,00 kWh/m²y**
PEC	**62,00 kWh/m²y**
Energy savings %	**44 %**
Absolute savings	**515.424,00 kWh/y**
Financial info	/

Partner: TREI Real Estate Germany Development GmbH

Building: Kaiser's Tengelmann Lohausen

GreenBuilding 2013

Project: New Building

Address: Niederrheinstrasse 84/92, 40474 - Düsseldorf-Lohausen

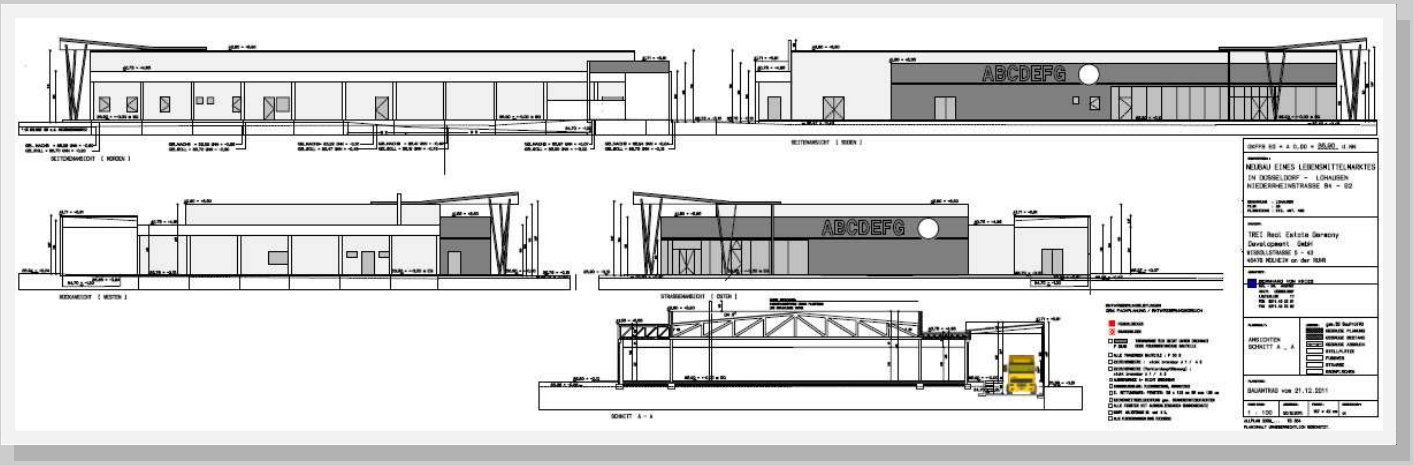
Country: Germany

Building Description and Technical Measures

The Kaiser Tengelmann supermarket is designed to decrease the CO_2 emission to minimum by a maximum of well-being for customers. The market is used 300 Days/Year. The average envelope U-value amounts to 0,46 W/m^2/K. For heating production an electric heat pump is provided. On the heating system a night-drawdown control system is active. For cooling is active a system based on renewable source (air-water heat pump). Permanent shading devices are placed on windows. The ventilation plant is equipped with a heat recovery system (75% of efficiency).

Technical Data

Building use	**Wholesale & Retail**
Area	**1.842 m²**
PEC before or reference value	**167,20 kWh/m²y**
PEC	**102,90 kWh/m²y**
Energy savings %	**38,4 %**
Absolute savings	**118.393,00 kWh/y**
Financial info	**€ 100.000**



Partner: Trotec Produktions und Vertriebs GmbH

Building: Trotec Office Building

GreenBuilding 2013

Project : Refurbishment

Address: Freilinger Strasse 99, 4614 - Marchtrenk

Country: Austria

Building Description and Technical Measures

The intention of this project was to develop a holistic energy solution for the office space and the production halls in order to reach minimal operating costs and CO_2 emission during all operation phase. The building equipment combine highly innovative technologies as: a brine/water and a water/water heat pump as primary and secondary heat generators; these components are supported by a generously sized solar thermal plant (180 m^2) combined with different buffer reservoirs. Solar gains from low temperature level are store in a fire pond and in ground-coupled collectors. The step-wise storage of the solar gains is regulated by an innovative energy management system (EMS). Ground water can be used for passive cooling purpose. The 49,75 kWp photovoltaic system delivers about 50.000kWh per year. Therefore the energy demand for heating, cooling and ventilation will be widely covered by renewable energies.

Technical Data

Building use	**Office**
Area	**2.684 m²**
PEC before or reference value	**123,90 kWh/m²y**
PEC	**44,00 kWh/m²y**
Energy savings %	**79,9 %**
Absolute savings	**214.451,60 kWh/y**
Financial info	**€ 515.000,00**

Partner: Ullevi Park 2 i Göteborg AB

Building: Ullevigatan 17-19

GreenBuilding 2013

Project : Refurbishment

Address: Ullevigatan 17-19, Göteborg

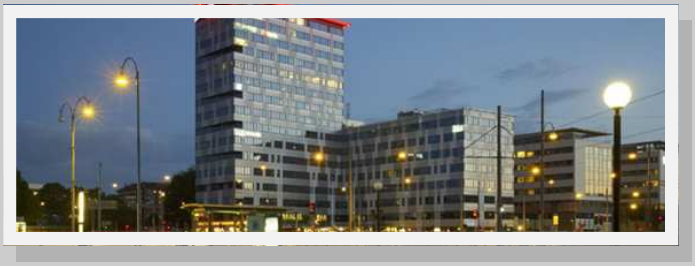
Country: Sweden

Building Description and Technical Measures

The building is 16 floors plus a basement including garage. The ground floor houses a restaurant and a shop while the remaining 15 floors hold offices.

The building is ventilated by supply and exhaust ventilation with heat recovery. The ventilation systems have constant air volume, CAV, with a flow of 1.3 l/(s, m^2) for the office space and between 3-5 l/ (s, m^2) for the restaurant and the shop at ground floor. Possibility to raise ventilation air flow is available in conference rooms and similar spaces. The garage is ventilated by an exhaust fan and receives air supply through the exhaust air from one of the ventilation systems with heat recovery. By this the heat left in the exhaust air is reused.

The building is heated by district heating via radiators and heating coil in the air handling units. The building is chilled by district cooling via chilled beams and cooling coil in the air handling units. Domestic hot water is prepared with district heating and hot water circulation losses are calculated with an assumed heat loss of 10 W/m. This heat loss is assumed to apply throughout the year when a lot is located in the shaft and not the building will benefit.



Technical Data

Building use	**Office**
Area	**16.797 m²**
PEC before or reference value	**100,00 kWh/m²y**
PEC	**67,00 kWh/m²y**
Energy savings %	**33 %**
Absolute savings	**554.301,00 kWh/y**
Financial info	**/**

Partner: Universität Wien

Building: Institutsgebäude Oskar-Morgenstern-Platz 1

GreenBuilding 2013

Project : Refurbishment

Address: Rossauer Lände 3, 1090 - Wien

Country: Austria

Building Description and Technical Measures

The complex consists of a rectangular main building (15 floors) and an adjacent second U-shaped building (9 floors). The buildings are connected by a big main staircase. After the renovation this building will be used by the University of Vienna. For this reason a library will be placed in the two basements and ground floor. The main engineering rooms are situated in the basement. The façade has been renovated and most of the windows have been replaced with new solar control glazing ones. The most important measures which had an impact on the energy efficiency of the building are related to the improvement of the building envelope as well as on the energy supply through district utilities as well as high efficient luminaries for emergency lighting. With improved insulation the building reached an envelope average U value of 0,52 W/m^2/K. The building is supplied by district heating and district cooling. The ventilation system is provided with heat recovery. All energy consumption values are monitored through a BEMS system.

Technical Data

Building use	**Education**
Area	**35.477 m²**
PEC before or reference value	**113,99 kWh/m²y**
PEC	**85,24 kWh/m²y**
Energy savings %	**25,2 %**
Absolute savings	**1.019.964,00 kWh/y**
Financial info	/

VASAKRONAN

Partner:Vasakronan AB

Building: Kurland 11

GreenBuilding 2013

Project : Refurbishment

Address: Holländargatan 21a, Stockholm

Country: Sweden

Building Description and Technical Measures

Kurland 11 is an office building, located at Holländargatan 21a in Stockholm, Sweden. It was constructed in 1884 and the total area is approximately 2 800 m2.

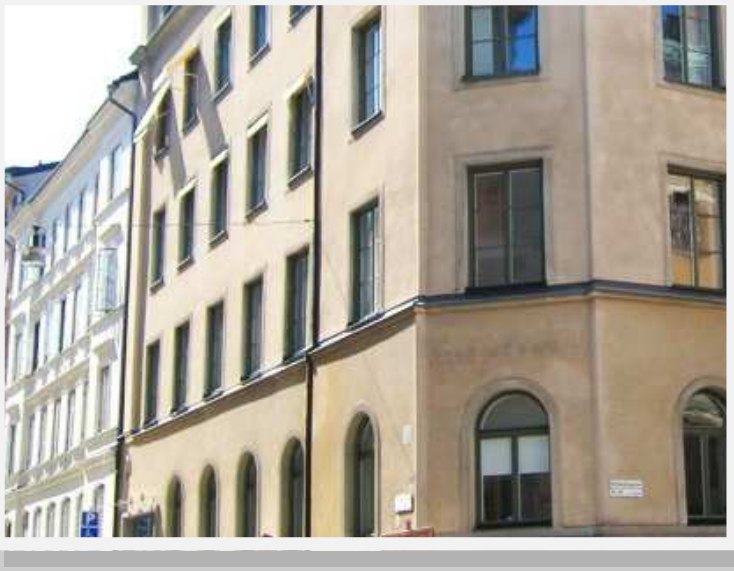
Kurland 11 is supplied by district heating from Fortum and a cooling machine.

The ventilation system has been upgraded with high efficiency heat recovery units. Fans, boiler room and chiller have been replaced.

The measured energy end use has been decreased with approximately 41.6 % and the building is therefore qualified as a GreenBuilding.

Technical Data

Building use	**Office**
Area	**2.800 m²**
PEC before or reference value	**149,20 kWh/m²y**
PEC	**84,00 kWh/m²y**
Energy savings %	**43,6 %**
Absolute savings	**182.560,00 kWh/y**
Financial info	/



VASAKRONAN

Partner:Vasakronan AB

Building: Kv Lejonet

GreenBuilding 2012

Project : Refurbishment

Address: Dragarbrunnsgatan 39, Uppsala

Country: Sweden

Building Description and Technical Measures

Kv Lejonet is an office building, located at Dragarbrunnsgatan 39 in Uppsala, Sweden. It was constructed in 1962 and the total area amounts approximately to 3.000 m^2. Kv Lejonet is supplied by district heating from Vattenfall and a cooling machine. The ventilations system has been upgraded with high efficiency heat recovering units. The measured energy end use has been decreased with approximately 32 %.

Technical Data

Building use	**Office**
Area	**2.689 m²**
PEC before or reference value	**206,10 kWh/m²y**
PEC	**141,00 kWh/m²y**
Energy savings %	**31,59 %**
Absolute savings	**175.054,00 kWh/y**
Financial info	/

VASAKRONAN

Partner: Vasakronan AB

Building: Magnus Stenbock 2

GreenBuilding 2013

Project : Refurbishment

Address: Gustav Adolfs Torg 12, Malmö

Country: Sweden

Building Description and Technical Measures

The total heated area for Magnus Stenbock 2 amounts to 5.397 m^2 with a total area for 5.018 m^2, the remaining area is warehouse and stores.

The building is supplied with energy for heating by district heating and the distribution system is waterborne, mainly through radiators. Magnus Stenbock 2 is supplied with central cooling and there are seven cooling machines with cooled supply air. The distribution system for cooling is airborne. All parts of the building have ventilation with heat recovery. The system has both supply and exhaust air with comfort cooling and there are standards for ventilation control in the building. The operating hours for the existing are office hours, but the temperature can be adjusted via thermostat in the premises.

Technical Data

Building use	**Office**
Area	**5.397 m²**
PEC before or reference value	**164,00 kWh/m²y**
PEC	**114,00 kWh/m²y**
Energy savings %	**30,5 %**
Absolute savings	**269.850,00 kWh/y**
Financial info	/

VASAKRONAN

Partner: Vasakronan AB

Building: Sumpen 14

GreenBuilding 2013

Project : Refurbishment

Address: Norrlandsgatan 22, Stockholm

Country: Sweden

Building Description and Technical Measures

Sumpen 14 is an office building, located at Norrlandsgatan 22 in Stockholm, Sweden. It was constructed in 1929 and the total area is approximately 2300 m².

Sumpen 14 is supplied by district heating and district cooling from Fortum Värme.

There have not been any extensions or installations of new technical equipment. All energy efficiency measures have instead been made through changes to the control of energy usage. One such change has been to shut off the comfort cooling during times when there are no work activities taking place.

The measured energy end use has been decreased by approximately 43%.

Technical Data

Building use	**Office**
Area	**2.300 m²**
PEC before or reference value	**256,60 kWh/m²y**
PEC	**147,00 kWh/m²y**
Energy savings %	**42,7 %**
Absolute savings	**252.080,00 kWh/y**
Financial info	/

VASAKRONAN

Partner: Vasakronan AB

Building: Sumpen 15

GreenBuilding 2013

Project : Refurbishment

Address: Stureplan 17-19, Stockholm

Country: Sweden

Building Description and Technical Measures

Sumpen 15 is an office and store building, located at Stureplan 17-19 in Stockholm. It was constructed in 1929 and the total area amounts approximately to 4.400 m².

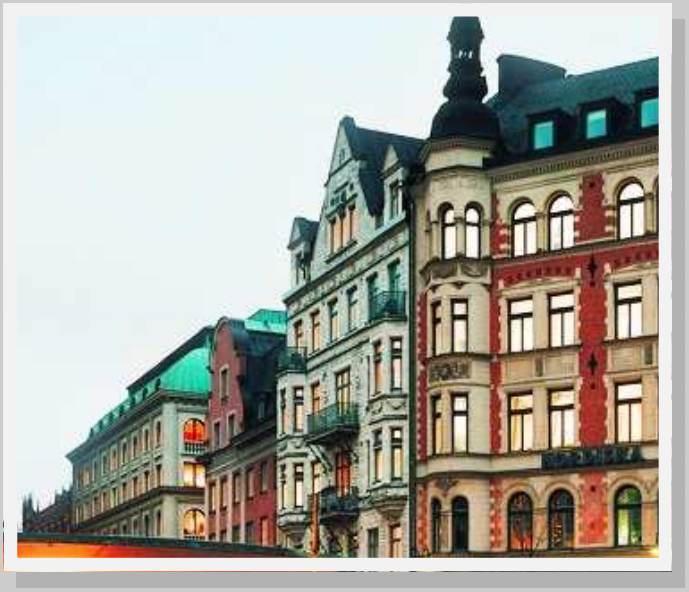
Sumpen 15 is supplied by district heating and district cooling from Fortum Värme.

There have not been any extensions or installations of new technical equipment. All energy efficiency measures have instead been made through changes to the control of energy usage. One such change has been to shut off the comfort cooling during times when there are no work activities taking place.

The measured energy end use has been decreased by approximately 29%.

Technical Data

Building use	**Office**
Area	**4.400 m²**
PEC before or reference value	**300,00 kWh/m²y**
PEC	**214,00 kWh/m²y**
Energy savings %	**28,6 %**
Absolute savings	**378.400,00 kWh/y**
Financial info	/



Partner: Wapnö AB

Building: Wapnö Gårdshotell

GreenBuilding 2013

Project: Refurbishment

Address: Wapnö Gård 215, 305 91 - Halmstad

Country: Sweden

Building Description and Technical Measures

This building concerns the refurbishment of an old farm, built in 1880. The farm has been converted into a hotel with 21 rooms.

The walls are made of brick and stone with a thickness of about 480mm, which has been improved with new insulation. Single glazed windows have been replaced with new efficient ones and guest rooms have been provided with insulated doors. To minimise the building's energy consumption efficient technical equipment have been installed.

Technical Data

Building use	**Hotel & Accommodation**
Area	**306 m²**
PEC before or reference value	**226,00 kWh/m²y**
PEC	**152,00 kWh/m²y**
Energy savings %	**32,7 %**
Absolute savings	**22.644,00 kWh/y**
Financial info	/

Partner: Wihlborgs Fastigheter AB

Building: Landsdomaren 6

GreenBuilding 2012

Project: Refurbishment

Address: Baravägen 1, 22240 - Lund

Country: Sweden

Building Description and Technical Measures

Landsdomaren will be used for various forms of psychiatry activities and medical support. The building will also hosts visiting rooms, patient wards, offices, conference rooms and more. The existing building was built in 1972 and has until now been used as an office building. The building has been deeply renovated: a new ventilation system and heating system has been installed; additional insulation has been placed on the roof and on the exterior walls. The building has a frame of concrete bearing walls. The channels for ventilation and heating are drawn inside; the plant reaches an efficiency of 80%. Ventilation is a VAV type and is equipped with presence detectors and temperature control.

Technical Data

Building use	**Healthcare & Social Work**
Area	**26.890 m²**
PEC before or reference value	**131, 00kWh/m²y**
PEC	**81,40 kWh/m²y**
Energy savings %	**37,86 %**
Absolute savings	**1.333.740,00 kWh/y**
Financial info	/

Partner: Ytterbygg AB

Building: Kolven 1

GreenBuilding 2012

Project: New Building

Address: Bultgatan 1, 44240 - Kungälv

Country: Sweden

Building Description and Technical Measures

This project concerns a new building that will host gym and training activities. Many different measures have been taken The energy saving systems are: efficient regulation system on heating; presence control for lighting and ventilation; the ventilation system has been provided with recovery system; recovery system for grey water from showers to heat water; water based distribution system for heating to radiators; district heating supply for heating and heat water. Ytterbygg developed the building, and will be the landlord who manages the building for the future. It will also compile the energy statistic every year.

Technical Data

Building use	**Sport & Leisure**
Area	**2.770 m²**
PEC before or reference value	**131,00 kWh/m²y**
PEC	**76,00 kWh/m²y**
Energy savings %	**41,98 %**
Absolute savings	**152.350,00 kWh/y**
Financial info	/

Partner: Zumtobel Lighting GmbH

Building: Zumtobel Lighting GmbH; Site Usingen

GreenBuilding 2013

Project: Refurbishment

Address: Achtzehn-Morgen-Weg 2, 61250 - Usingen

Country: Germany

Building Description and Technical Measures

Zumtobel Lighting GmbH develops and produces luminaires and medical supply units. The compound consists of one office building and five technical halls. The intervention on this building mainly concentrated on the renovation of the heating system: the old oil boiler has been replaced with a new one, supplied with natural gas. The heating system was also equipped with well dimensioned heating pumps with power regulation. Thermostatic radiators valves were installed. The temperature of the boiler's hot water was reduced. The division of the heating circuits was optimised. A co-generation plant was added for the production of heat and electricity.

Technical Data

Building use	**Manufacturing & Industry**
Area	**8.020 m²**
PEC before or reference value	**320,60 kWh/m²y**
PEC	**239,70 kWh/m²y**
Energy savings %	**26,6 %**
Absolute savings	**1.867.412,00 kWh/y**
Financial info	**€ 466.879,00**

European Commission

EUR 26709 EN – **Joint Research Centre – Institute for Energy and Transport**

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Abstract

In 2005 the European Commission launched the GreenBuilding Programme (GBP). GreenBuilding is a voluntary programme aiming at improving the energy efficiency of non-residential buildings in Europe on voluntary basis. The programme addresses owners of non-residential buildings to realise cost-effective measures which enhance the energy efficiency of their buildings in one or more technical services. The programme covers both existing and new buildings.

In a number of participating countries, a so called GreenBuilding National Contact Point (NCP) is established for aiding organisations who consider participation in GreenBuilding (see the NCPs). In countries where no NCP is established, the Joint Research Centre assists the potential participant.

The GreenBuilding Programme is managed by the Joint Research Centre.

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Stimulating innovation
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